Original Communications.

ARTICLE I.

THE PSEUDO-BACILLUS TUBERCULOSIS. By H. D. SCHMIDT, M.D., Pathologist to the Charity Hospital of New Orleans. (Read before the New Orleans Pathological Society.)

In the December number, 1882, of this journal, I published a paper, containing the most prominent points of the results which I had obtained from a series of microscopical investigations into the nature of the so-called bacillus tuberculosis, of Koch. These investigations, as will be remembered, ended in the discovery of minute fat crystals, contained in certain cells of the miliary tubercle, or tuberculous mass, as well as in the expectoration of tuberculous patients.

In this paper, I also mentioned a discovery which I had made, concerning the formation of the same form of crystals in sections of fattily infiltrated or degenerated tissues, when treated with a solution of caustic potassa, or any other alkali; but, for the want

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of time, I then forebore to enlarge upon this observation.   Having, since the above treatise was written, continued my investigations on the crystalline pseudo-bacillus tuberculosis, as well as on the artificial formation of these crystals in fattily infiltrated tissues, I shall now furnish additional details, which may serve to elucidate more fully the facts already published.   And, in order to obtain a basis for our discussion upon the formation of fat crystals in animal tissues, we shall, of course, only as far as our subject demands, first refer to some of the facts, observed under the microscope, and relating to the formation of these crystals outside of the tissues, as, for instance, in tallow, or pure human fat.

Before, however, entering upon the discussion of the artificial production of these crystals, a few brief remarks regarding the temperature at which they may be formed, will not be out of place.   When, during the month of May or June, of the preceding year, I first discovered that fat crystals would form upon the sections of fattily infiltrated organs, the temperature in this city was quite high, probably ranging from 85° to 90° F., or even more ; and, therefore, by treating the sections with a 30 per cent. solution of caustic potassa, I found that the crystals had formed in about twenty-four hours.   In a thin film of tallow, spread upon a glass slide and treated with the same solution, I observed a number of single crystals of stearic acid appearing in even as short a time as half an hour, though, for certain reasons, to be mentioned directly, I am now inclined to think that they had previously existed in the tallow, and were simply rendered visible by the potash solution.   In sections of a tuberculous lung, treated with this solution, new crystals appeared in the space of two or three days.   But, as during the remaining part of the summer, my principal object in view was still to positively determine the crystalline nature of the rod and needle-shaped bodies, formed in the tuberculous cells during life, I neglected to take particular notice of the exact time when the artificially produced crystals would make their appearance in the tissues.   Nevertheless, from the numerous sections, which I re-examined from time to time, after being treated with solutions of different alkalies, and of different strengths, I observed that the length of time,

required for the artificial formation of these crystals, was proportionate to the strength, not only of the solution, but also of the alkali itself; and, furthermore, that the stronger the alkali, the more perfect and extensive would be the crystallization. In the same manner does the length of time required for the crystallization depend upon the temperature of the surrounding atmosphere, for the lower the temperature, the longer will be the time necessary for the formation of the crystals. With these preliminary remarks, we may now proceed to the consideration of the artificial production of fat crystals, and shall commence with those found in tallow, or human fat, by the action of caustic potassa.

The easiest way to produce these crystals is to spread a thin film of tallow, about one-half an inch in diameter, upon a glass slide, with a clean piece of tallow candle, and, after the application of a few drops of a 30 per cent. solution of caustic potassa, to put on the cover-glass. Then the surplus of the solution is removed by blotting paper, the preparation hermetically closed with Bell's cement, or Canada balsam, and put aside. After one or more days, according to the height of the temperature, minute crystals of stearic acid will successively appear in the film of tallow. Generally, these crystals appear in the form of delicate double-pointed needles, which, by the overlapping of their points, arrange themselves to form filaments, and these again to form branches resembling those of our native pine trees. These branches, finally, represent the components of the most beautiful stellate figures, a portion of one of which is found represented in Fig. 1. But, frequently also, the crystals are met with in the form of minute rods, either single or arranged in small isolated branches, as seen in Fig. 2.

Although I have thus far observed and studied, to a certain extent, the different phases of crystallization through which a patch of fat passes, until it is converted into the above mentioned figures, I have, as yet, not had sufficient time to inquire into the special laws, which determine the particular form of the crystals, or of the different figures formed by them. Besides, the forms which a large patch of fat assumes, while passing through the different phases of crystallization, are quite variable, so that a thorough investigation into the laws governing them

could only be made with a considerable sacrifice of time, which I could not make just now. But, as my object of discussing the modes of crystallization of fat, in this place, is to better elucidate the crystalline nature of those minute rods and needles, contained in certain tuberculous cells, I may add that when large neighboring patches of fat pass into the state of crystallization, they generally first approach one another, and unite sufficiently to form a body, the outlines of which resemble those starlike figures ; these, in proportion to the advancing crystallizing process, gradually assume a more definite shape. Upon this body a general mapping out of the branches and needles is then observed, which, as the crystallization advances, becomes more and more distinct, until the individual needles are, finally, completed. Sometimes the body consists of a considerable number of plates, or scales, of various angular forms, arranged in different manners, which are eventually converted into the minute needles or rods. In the case of small patches of fat, or of fat globules, the rods or needles grow directly out of them ; very small fat globules are converted, according to their size, into only one or a few rods. This mode of formation of the rods and needles is, as we shall see hereafter, observed in the sections of tuberculous tissues, some time after having been treated with caustic potassa. Sometimes, the fat crystallizes into a prismatic, or otherwise angular mass, composed of the minute rods.

If a film of tallow upon a glass slide is treated with a solution of sodium hydroxide—of the strength as first prepared by the decomposition of a solution of sodium carbonate with calcium hydroxide—numerous single stearic-acid crystals are produced, which in every detail resemble the pseudo-bacilli tuberculosis ; though, here and there, branches, as above described, are also observed to form. The same crystals will be formed, when a film of tallow is treated with *aqua ammoniæ fortior ;* many of them appear here in the form of minute rods, arising from oblong patches of fat, which by mutual communication form a wide-meshed network.

If a film of human fat be spread upon a glass-slide by rubbing the latter with a small piece of adipose tissue, no crystals will form by the action of the potash-solution ; but, if small frag-

ments of the tissue itself are left upon the slide, delicate sword
or needle-shaped crystals of margaric acid will appear, forming
the same branches and stellate figures as above described in con-
nection with the tallow ; among these are also observed plates
and prismatic masses.

When the above mentioned crystals, formed in the tallow or
human fat, are examined under the microscope with a sufficiently
high power,—from 300 to 500 diameters,—it will be observed
that they invariably present a very fine, delicate outline on one
side, and a very dark and heavy one on the other ; these outlines,
like those of crystals in general, are very sharply and distinctly
drawn.   Those stellate figures, as well as single branches, or
larger or smaller prismatic masses, formed by these minute fat
crystals, present a very brilliant appearance when examined with
the polariscope.   Upon a dark field they generally appear of a
bright yellow, a blue, and a red color.   The yellow, however,
always predominates ; for, though some of the crystalline branches
may appear blue, or red, the greater part of the figure still pre-
sents the yellow.   In changing the field from the dark to the
light, by the turning of one of the prisms, these colours, of course,
will gradually disappear.   Isolated needles, or rods present upon
the dark field only the brilliant yellow.   Examined with chro-
matic polarization the crystals exhibit the usual complementary
colors.   When any group of these crystals is examined with very
oblique light, obtained either by means of an Abram's achromatic
prism, or by a Power and Lealand's homogeneous achromatic
coondenser, they will exhibit the same colors, as upon the dark
field of the polariscope, only in a lesser degree.

Having thus briefly discussed the formation of fat crystals,
produced by the action of an alkali outside of the tissues, and
their behavior when examined with polarized or very oblique
light, we may now proceed to consider the formation of these
crystals in fattily infiltrated tissues, treated not only with alka-
lies, but also with certain acids.

Although fat crystals will form in any tissue, affected with
fatty infiltration, or degeneration, I have, for the sake of uni-
formity, made use in these experiments of sections taken from
the fatty livers of fatal cases of yellow fever.   If, now, a thin

section of such a liver is treated with a 3) per cent., or weaker solution of caustic potassa, minute needle or rod-shaped crystals, either single, or forming branches (Fig. 3), or prismatic bodies, will appear in the section in a few days. The individual crystals, as well as the branches they form, closely resemble those formed in the film of tallow; it may therefore be supposed that they represent stearic acid. If such a section be treated with a solution of caustic soda, the same crystals will be observed to appear, only differing slightly in their arrangement in forming branches (Fig. 4). In the same manner are these crystals observed to form, if the section be treated with *aqua ammoniæ fortior*. However, the formation of fat crystals in these sections does not only take place by the action of the above mentioned alkalies, but, moreover, if the sections are treated with formic or glacial acetic acid. When examined upon the dark field of the polariscope they appear in the same brilliant light and colors as the crystals, artificially formed in the tallow by the action of alkalies; and if examined with plain, transmitted light, it will be found that the individual minute crystals resemble in every respect the pseudo-bacilli tuberculosis.

The above described phenomena, relating to the formation of crystals in fat, either pure, such as tallow, or contained in tissues affected with fatty infiltration, or degeneration, through the action of alkalies, or that of formic, or acetic acids, cannot but appear contrary to the known chemical laws, according to which the fat should become saponified by the alkali, without the setting free of its acids. We may, therefore, presume that the liberation of the latter is effected by a combined action of the alkali and the tissues. All alkaline solutions, as we know, affect the protoplasm of most tissues, especially that of the cells; and, if the solution is sufficiently concentrated, it will eventually entirely destroy the protoplasm. The alteration, or final destruction of the tissues, however, can only take place by a chemical combination of the alkali with their albuminous constituents. To explain the phenomenon under consideration, therefore, we may presume that in virtue of this combination, or by a body resulting from it, the glycerine is abstracted from the neighboring fat, and the acids set free to crystalize. The formic and acetic acids affect the

protoplasm, especially that of the cells, in a manner similar to the action of the alkalies in a lesser degree; and, very probably, also form a combination with its albumen, leading to the same final results of liberating the acids of the fat in the vicinity. In the case of the tallow, I presume, that though this is generally regarded as pure fat, it still contains some albuminous substances, derived from the tissues from which it was extracted, and with which the alkali would enter into combination; this supposition gains in strength from the fact, above stated, of no crystals being formed in human fat, rubbed upon the slide with a fragment of adipose tissue, and treated with an alkaline solution.

The above explanation regarding the process of the formation of fat crystals in fattily infiltrated tissues by the action of alkaline solutions, of course, rests only upon a mere supposition, to which I was led by observing that these crystals never appeared, before the protoplasm of the tissues was almost entirely destroyed; or, at any rate, before the tissues had completely lost their morphological characters. To render a more detailed and rational explanation of the apparently contradictory phenomena witnessed in this process, must be left to the special chemist.

To the preceding discussion on the artificial production of fat crystals in tallow, or in sections of fattily infiltrated tissues in general, I have now to add some special remarks, concerning the appearance of these crystals in sections of tuberculous tissue, some time after being mounted in a solution of caustic potassa. If such a section be treated with a 30 per cent. solution of this alkali, and examined under the microscope, the first change observed is a general clearing up of the component histological elements, rendering the whole section more transparent. And, as the transparency of the section increases, a number of certain cells, filled with larger or smaller fat globules, associated with, or without black pigment granules, gradually make their appearance. With the increasing action of the alkali on the protoplasm of these cells, they, also, are rendered clearer and clearer, until, finally, their contents are exposed to a full view. It will then be seen that, while all of these cells contain fat globules or pigment, only a number of them may contain the minute fat crystals, or pseudo-bacilli, which I have described and represented

in Figs. 1 and 2 of my late paper on this subject. But, as the action of the alkali upon the tissues is still going on, the outlines of the latter are generally lost, until, with the exception of the alveolar elastic tissue framework, they are converted into a shapeless granular substance. While, however, the protoplasm of the tissues, particularly that of the cells, is thus altered, or even destroyed, by the caustic action of the alkali, the fat globules, pigment, and pseudo-bacilli, contained in those peculiar cells, above mentioned, remain unaffected, and are exposed to a better view in the empty fields, mapped out by the elastic-tissue framework. In a section thus prepared, the character of the minute rods and spindles, placed between the fat globules, may be studied to the greatest advantage. The fat globules, left by these cells, whether associated with pseudo-bacilli or not, may always be recognized by their grouping representing the outlines of the cells in which they were formed ; very frequently, also, they are associated with pigment. Besides these groups of fat globules, however, a great number of larger or smaller isolated fat globules are now observed over the field of the microscope ; these are derived from the fat contained in the remaining more numerous cells of the miliary tubercles, which, also, was set free by the action of the alkali upon the protoplasm of the latter. If, now, the section be examined with the assistance of the polari-scope, it will be found that *the pseudo-bacilli, and many of the minute fat globules, between which they lie, appear most brilliantly illuminated, as soon as the prisms of the instrument are crossed, and the field is rendered dark*—while those numerous isolated fat globules remain dark. In fact, the minute rods and spindles polarize the light in such a degree as to remove every doubt that might still exist in regard to their crystalline nature. *True bacilli, such as B. ulna and B. subtilis, as well as all other bacteria, as I know from experience, do not possess double refraction, but remain dark upon the dark field of the polari-scope.* If the minute rods, spindles and needles, contained in the cells are very numerous, such as represented in Figs. 7 and 8 of this paper, they will, exactly like the fatty acid crystals found in tallow, exhibit the complementary colors, namely, bright yellow, blue and red. But, it is not alone these minute crystalline

rods and spindles that appear brightly illuminated upon the dark
field of the polariscope, for, those groups of minute fat globules
not associated with pseudo-bacilli, also show the beginning of
crystallization by emitting a feeble light which distinctly marks
their outlines; very frequently, minute luminous points are
observed upon the feebly illuminated area of the group, indica-
ting an advanced phase of crystallization in some of the minute
fat globules. The crystallization of the fat into those minute
rod, spindle and needle-shaped bodies (pseudo-bacilli), contained
in the fattily degenerated cells under discussion, of course, took
place during the life of the patient, while the potash solution
applied to the section, thus far only served to render them visible
by destroying the protoplasm of the cells. But, if now the sec-
tion be left exposed to the action of the alkali, the fat, set free
by the latter in the form of isolated globules, and seen distribu-
ted throughout the section, will undergo an artificial crystalliza-
tion, such as we witnessed in the sections of fattily infiltrated
yellow-fever liver, above described. Thus, in the course of
several days, if the temperature of the surrounding atmosphere
be sufficiently high, a number of minute needle-shaped crystals,
arising from the smaller fat globules, will appear distributed over
the section, as well as over the rest of the field. These crystals
closely resemble, in all their characters, the pseudo-bacilli. Fig.
5 represents a small portion of such a section, several weeks
after it had been treated with a potash solution, and when the
protoplasm of the cells was destroyed by the action of the alkali.
The remains of two of these cells containing the pseudo-
bacilli, and of another containing none of them, are seen in the
upper part of the drawing; while, scattered over the rest of the
section, a number of single minute crystals, artificially formed
after the mounting of the section, may be observed.

Very frequently, however, smaller or larger groups of these
minute crystals will be observed to arise from the larger fat
globules in such a section (Fig. 6 a and b); in these cases, the
process of crystallization generally advances until all the fat of
the globule has been converted into the minute crystals. The
size of the latter appears to depend, to a certain extent, upon
the size of the fat globule; for, if the latter be very small, the

crystal will be below the average size. In this manner, those very minute rod-shaped pseudo-bacilli are derived from the minute fat globules associated with them in the respective fattily degenerated cells. Sometimes, a group of crystals arises in mass from a patch of fat (Fig. 6, c); or a large fat globule is converted into a cluster of minute, closely packed, rod-shaped crystals, such as seen at d of the same figure. If the quantity of fat in such a section be very abundant, large patches of fat, formed by the fusion of a number of large fat globules, will frequently be met with, from which large figures, composed of scales or needles, may be seen to arise. Examined upon the dark field of the polariscope, these crystals exhibit the same complementary colors, as those described before.

Although I have already described, to a certain extent, in my previous paper on this subject, those fattily degenerated cells containing the minute fat crystals, a few additional remarks on their nature and probable origin would not be improper. When a section of a miliary tubercle is examined, while clearing up by the action of the alkaline solution, or of acetic acid, it will be noticed that not all the cells of the tubercle are undergoing fatty degeneration. On the contrary, especially if the tubercle be small and still isolated, only a few cells, filled with fat globules, may be met with, enclosed in the general mass of tubercular cells of one or the other alveolus. While, however, the great majority of tubercular cells present a number of irreg-ular forms, produced by mutual pressure, these fattily degenerated cells may be easily distinguished, not only by their round, or oval form, but moreover, by their opaque, brownish or blackish appear-ance, caused by the refractive property of the fat globules within; or, also, by the pigment, or the fat crystals which many of them contain. While, however, cells filled with fat globules are met with in tubercles of almost every case of tuberculosis, they do not always contain pigment, or fat-crystals. In fact, as I have before stated, I have met with some cases of tuberculosis, in which I failed to detect any fat crystals in the tuberculous portions of the lungs; while in other cases, great numbers of these fattily degenerated cells were met with, almost completely filled with pseudo-bacilli, minute fat globules and pigment. Some of these

cells were very large, while others were comparatively small (Fig. 7). Among these were also observed a number of cells, almost entirely black from the quantity of pigment and minute fat globules which they contained. They were generally found in those tuberculous alveoli bordering on the highly congested, non-tuberculous portions of the lung. Very often, cells, filled with pseudo-bacilli, are observed to adhere to the walls of alveoli, which as yet are not entirely filled up by the proliferating tubercle cells. I am, therefore, inclined to regard them as epithelial cells of the alveoli, which, undergoing fatty degeneration, are incapable of multiplying, and thus become surrounded by the proliferating neoplastic cells during the development of the tubercle. This view is strengthened by the fact that, in many instances, they appear in small groups, lying loose, or simply buried in the tubercular mass; though this view needs to be confirmed by further and more positive observations. In the expectoration of phthisical patients, cells, in every way identical with those above described, are very often met with ; they are generally filled with fat globules, though, not unfrequently, they also contain pigment and pseudo-bacilli. In these cases, the expectoration also contains a number of free rod-shaped crystals.

In studying the pseudo-bacilli in sections of tuberculous lung, it is, of course, desirable to have them permanently mounted, both for future study and reference. This, however, is impossible as long as the sections are saturated with the alkaline solution, which not only destroys almost the whole tissue of the section, but, moreover, eventually gives rise to the artificial formation of additional fat-crystals. To mount the sections permanently, therefore, they must be free from every trace of the alkali which they contain. The best method of accomplishing this purpose I have found to be as follows : In order to completely remove the alcohol contained in the sections from the mixture of alcohol and water in which they were kept, they are first put into filtered water, from which they are transferred to a 30 per cent. solution of caustic potassa. In this they are kept for about twenty minuets, when they are again transferred to pure water, in order to get rid of the alkali. From the water they are, by making them float upon a spatula, transferred to the slides, from which the sur-

plus is allowed to run off, while the rest of this fluid is carefully removed up to the margins of the sections, with a camel's-hair brush. Then, two or three drops of the 30 per cent. solution of potassa are put upon each section, and left for about ten or fifteen minutes, at the end of which time the action of the alkali will have rendered the sections sufficiently clear to allow the study of the pseudo-bacilli. Now, the alkali must be removed by repeatedly washing the sections upon their slides with fresh water, until the test-paper shows no alkaline reaction. Then, the water is again entirely removed from the slides up to the margins of the sections, about three drops of a mixture of one part of filtered glycerine and two parts of water put upon each of the 'atter, and the cover-glasses applied. The preparations may be hermetically sealed with Bell's cement or Canada balsam.

For certain information, relating to the pseudo-bacillus tuberculosis, which I received, after the preceeding pages of this paper were written, I must now slightly deviate from the regular course of our discussion, in order to consider another part of the subject. A few weeks ago, in order to show the correctness of my statements regarding the crystalline nature of the rod-like bodies which I had met with in certain portions of tuberculous lungs, I sent to several medical friends of Chicago and Philadelphia, a number of ready prepared and mounted, as well as unmounted, sections of tuberculous lung tissue, with the special direction of examining them with the aid of the polariscope. Now, the result of these examinations, which I learned several days ago, fully confirms the existence of the pseudo-bacillus tuberculosis which I discovered, but excludes its identity with the bacillus tuberculosis of Koch, which I, accordingly, failed to make visible in the sections of the tuberculous lung. My next object in view, therefore, must be to ascertain the particular cause of my failure, which, as I had very closely followed in the staining of my sections the directions given for the methods of Koch, Ehrlich, and Gibbes, could only be found in the quality of the material which I had used. That this may have been the real cause, I learned, a few days ago, by the meeting of an expert in the staining of tuberculous sputa. This gentleman, Mr. H. Woltmann, of Chicago, had been directed by Dr. Gradle, of the same city, to pay me a

visit, on his way to Texas, for the purpose of showing me the veritable bacillus tuberculosis of Koch. Although the time, which this gentleman had to spare was rather short for a thorough examination of the subject, I became, nevertheless, convinced of his familiarity with the staining of sputa by the beautiful preparations he showed me, besides having the pleasure of spending some hours of the afternoon and evening with him in the staining of some of my sections and the examining of the so-called bacillus tuberculosis in his preparations of sputa. Now, as regards the material which I had formerly used in my attempts of staining the parasite, he at once perceived that the aniline oil was impure, and consequently unfit for use ; for, while it was of a brown color, it, moreover, showed an acid reaction upon test paper. Fortunately he had with him the aniline oil which he had used for his staining ; this was perfectly clear, but, without his previous knowledge, also showed an acid reaction upon the test paper ; though it had been alkaline when he first obtained it. Nevertheless, as there was no alkaline aniline oil at hand, he showed me with this his method of staining, which, in substance, is a combination of those of Ehrlich and Gibbes, and which, on the whole, I had closely followed myself. The principal deviation which he makes from these methods, consists in using methyl-blue as the ground color, instead of chrysoidin, for the magenta-stained parasites. For the examination of his preparations of sputa, he had with him one of Zeiss' famous illuminators, which we managed to apply to my Zentmayer's "Grand American" microscopical stand. With this illumination he showed me through my Tolles' $\frac{1}{10}$ dry objective, which possesses a very fine definition, upon the blue ground of the sputa a number of very minute filamentous bodies, appearing thoroughly stained red by the magenta. Though Mr. Woltmann had hitherto looked upon these bodies as representing minute rods, I perceived, at once, the granular appearance of these filaments, which was rendered still more distinct by using a higher eye-piece. Upon my asking for the authority upon which Mr. Woltmann had regarded these filamentous bodies as the veritable bacilli tuberculosis of Koch, he named Dr. Belfield of Chicago, a gentleman who had studied Koch's bacillus in Germany.

Let us now consider a little closer these bodies in Mr. Wolt-
mann's preparation of sputa, which is now by his kindness in my
possession.   When this gentleman had left, I subjected these
filaments to a still closer examination by the use of my Powell
and Lealand's homogeneous achromatic condenser, which though
not furnishing the intense light obtained by the illuminating
apparatus of Zeiss, nevertheless illuminates the object quite suf-
ficiently for an accurate examination.   On the contrary, the less
intense light, obtained by Powell and Lealand's condenser, is
much better suited for the study of the form of these minute
bodies than the brilliant illumination obtained by Zeiss' appara-
tus.   This examination still more distinctly showed me that these
minute filaments were, in proportion to the difference in the
length, composed of from two to six distinct granules; and that,
besides, a number of single granules could be seen distributed
among them.   Though the majority of these filaments were
straight, a certain number of them appeared curved.   The diame-
ter of the granules composing them I found to be $\frac{1}{1400}$ mill.; while
the average length of the filaments is from four to five granules.
There remains no doubt that these organisms are identical with
those which Gibbes stained and examined in sputa, and which he
found to represent rows of spherical bodies (*London Lancet*,
August 5, 1882).   Like him, I found that they may be well seen
with an ordinary objective, such as Bausch and Lomb's, or Zent-
mayer's $\frac{1}{5}$ student objectives; even the granular character of the
filaments may be distinguished by these objectives.

The question may now justly be asked, whether these perfectly
stained granular filaments, contained in the sputa, prepared and
exhibited to me by Mr. Woltmann, are in reality identical with
the bacilli tuberculosis of Koch.   Any one familiar with the
special character of a bacillus, and particularly with Koch's
description of the bacillus tuberculosis, cannot but answer this
question in the negative.   Bacilli represent minute straight rods
with blunt, almost square, extremities; and as such Koch has
described the organisms which he discovered in tuberculous lungs.
Neither can it be said that the granules, of which the filaments
contained in the Mr. Woltmann's preparations of sputa are com-
posed, might represent the spores of the bacillus tuberculosis;

for, if these were the spores, we might properly ask, where is the body of the organism?   Besides, Koch describes the spores of his bacillus as being oval in form, from two to four in number, and distributed over the whole length of the rod at equal distances. From what I know by my own observations upon the spores of bacillus subtilis, the body of the organism is not annihilated by the setting free of the spores.   Therefore, we must conclude that these granular filaments do not represent Koch's bacillus tuberculosis, though they evidently possess the property characteristic of this bacillus, of retaining the particular coloring material which they first absorbed, against another offered to them subsequently. This point, though at present left unexplained, will certainly be cleared up in the end.   But the organisms themselves appear to represent sphero-bacteria.   I doubt not, but that in many instances these organisms have been stained and passed for Koch's bacilli tuberculosis.   They certainly do not represent true bacilli ; and I may safely assert that my pseudo-bacilli tuberculosis possess more of the morphological characters of true bacilli than these filaments ; particularly, when some of the minute fat-globules are observed to adhere to one or the other crystalline rod which would make the whole resemble a spore-producing bacillus.

From that I have learned from medical journals, hitherto, the examinations made for the detection of the bacillus tuberculosis, were chiefly confined to sputa, for the reason that this matter can be more easily obtained than a tuberculous lung.   I, for my part, as I have said before, attach no significance to the presence of micro organisms in the expectoration of phthisical patients, but am the more anxious to behold them in the tissues of the lungs, and in the very place where they are said to give rise to the disease in question.   And though I have thus far failed to detect this bacillus in the sections of lung which I stained, I shall certainly take up the subject again as soon as I shall receive the proper material for the staining, and shall not rest until I shall have either satisfied myself as to the existence of this pretended parasite, or, at least have thrown some light upon the different forms under which it appears to different observers.

It is a singular coincidence that my pseudo-bacillus is specially met with in some of the same localities of the lungs which Koch

has assigned to his genuine bacillus tuberculosis, as, for instance, along the margin of the tubercles.   In a case of miliary tubercles of no great extent, I met along the peripheries of the single miliary tubercles crystalline rods, as small as the stained filaments in Mr. Woltmann's preparation of sputa, and which, at any time, might have passed for true bacilli.   But, as these crystals are not met with in all fattily degenerated cells of the tubercles, and, moreover, not even in all tuberculous portions of the lungs of different cases, it may be presumed that they are formed only under certain conditions of the particular part in which they are found, or, perhaps, of the whole individual.   I have, as yet, not had sufficient leisure to direct my attention to this point, but shall do so in future.   Like the true bacillus tuberculosis of Koch, the pseudo-bacillus, also, together with the fattily degenerated cells, with or without pigment, when found in the expectoration of the patient, may prove valuable in the diagnosis of the case; as their presence must certainly indicate grave lesions in the lungs. The particular quantity of fat, found in the expectoration of the patient, and which may be determined by treating it with the solution of caustic potassa, also, may be of service in the diagnosis, as it will indicate the grade of fatty degeneration.

EXPLANATION OF ILLUSTRATIONS.

FIG. 1.—Portion of a comparatively large stellate mass of crystals of stearic acid, formed in a film of tallow, treated with a 30 per cent. solution of caustic potassa. The individual crystals, of which the branches of the mass are composed, appear in the form of needles.

FIG. 2.—Branches, formed by minute rod-shaped crystals of stearic acid, met with in the same preparation.

FIG. 3.—Fat-crystals, formed by the action of a 30 per cent. solution of caustic potassa upon the surface of a thin microscopical section of yellow-fever liver affected with fatty infiltrations.

FIG. 4.—Fat-crystals, formed by the action of a solution of caustic soda upon the surface of a section of the same liver; in *a* the crystals are lancet-shaped, in *b* rod-shaped; in these figures a few patches of fat, from which the crystals arise, are still seen.

FIG. 5.—Small portion of a section of miliary tubercle, several weeks after having been mounted in a solution of caustic potassa, when the protoplasm has been rendered nearly invisible. In this section the remains of two of those cells, containing the fat crystals (pseudo-bacilli tuberculosis), together with the fat globules left from another such cell without crystals,
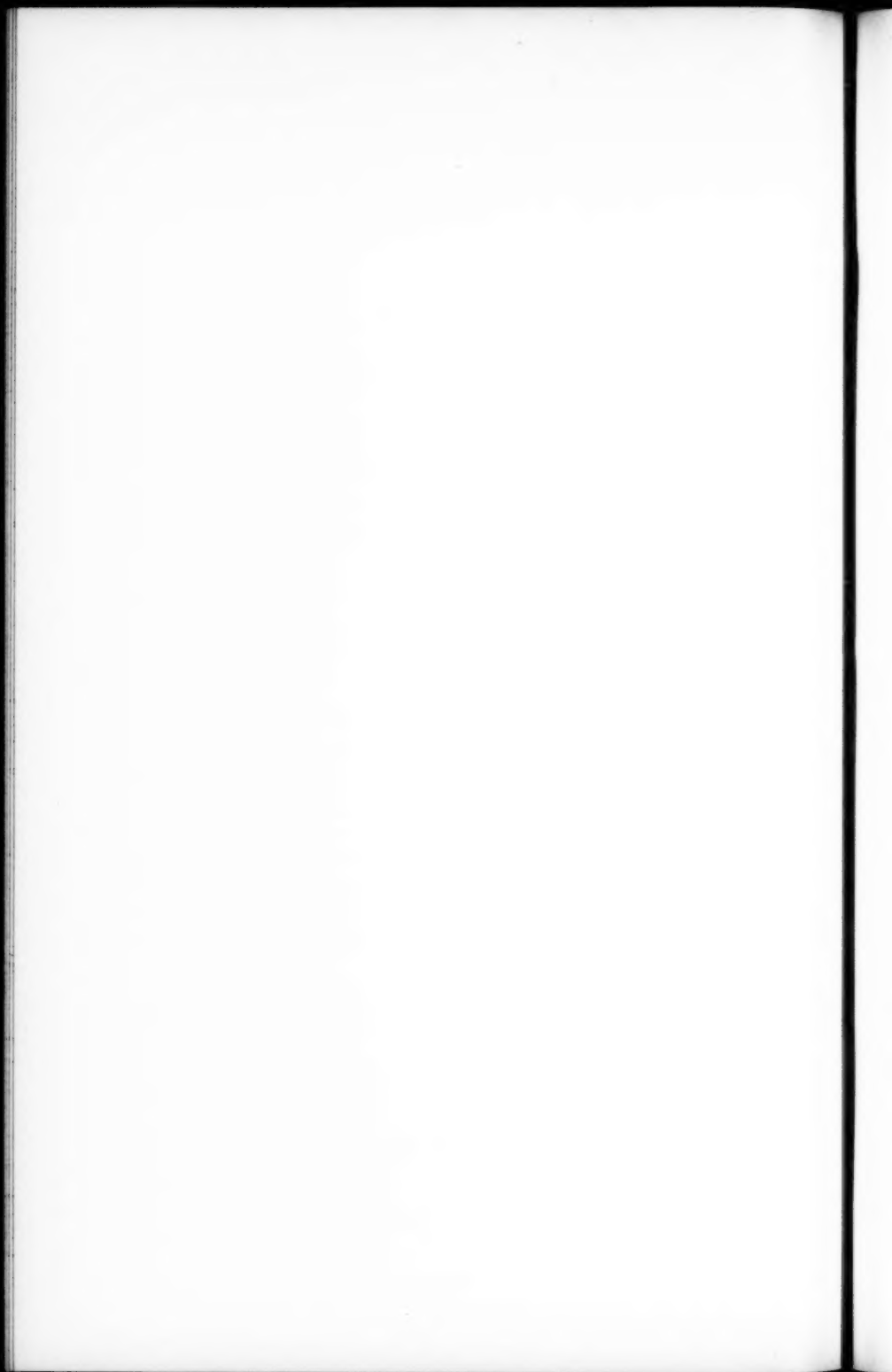
may be still observed in the upper part of the drawing; while, further below, a number of single needle-shaped crystals are seen scattered throughout the section. The latter were artificially formed, some time after the mounting of the section.

Fig. 6.—Fat-crystals, formed by the action of the potash solution in another section of tuberculous lung, some time after its mounting; *a* represents the crystals while arising from the fat-globules: *b*, different groups of the crystals after the entire consumption of the fat; *c*, the crystals arising in mass from the fat-patches; *d*, large fat globules, entirely converted into minute rod and needle-shaped crystals. ·

Fig. 7.—Large cells, met with in a section of the lung from a case of pulmonary phthisis (cheesy pneumonia); they are nearly filled with pseudo-bacilli tuberculosis, minute fat-globules and pigment granules; *a*, group of unbroken cells; *b*, a large cell crushed by pressure made upon the cover glass, in order to expose the crystals to full view.

Fig. 8.—One of these cells almost completely filled with the crystals which are arranged parallelly.

Article II.

Thoughts Suggested by the Death of Richard Wagner. By Dr. James I. Tucker, Chicago.

On the second étage of the Palais Vendremint in the city of Venice, on the 14th inst., Richard Wagner, the great composer, died at the age of seventy. He had long been a sufferer from cardiac disease, the exact nature of which the dispatches do not state.   On Tuesday he ordered his gondola for 3 o'clock, intending to take his customary promenade on the Grand Canal.   As he was about to leave he was attacked by "a fit of asthma." He murmured, "I feel very bad," became unconscious, and at 4 o'clock died, surrounded by his wife, his four daughters and his favorite son, Siegfried.   Thus ended the eventful career of him, who by genius, application, resolution and perseverance had become doubtless the greatest composer that ever lived; greatest not in the intensity and originality of his genius, but in that he took up the lyric drama at the zenith of its evolution and carried it forward to a point so much higher that centuries will probably elapse before a greater than he, in the light of future science, will venture to undertake a similar task; when what is now the

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Music of the Future shall have become a thing of the past. The peer of Beethoven he had the massive Beethoven foundation as an inheritance upon which to erect his colossal superstructure. The great movement inaugurated by Beethoven expanded into the Wagnerian opera, a complete lyric structure in which the correlation of the Fine Arts was recognized and made the corner-stone, a structure in which there was no disproportion or discord, but wherein music, poetry, painting, action and oratory were one. "There is poetry," wrote Goethe, "there is painting, there is music and song, and there is the wit of representation. When all these arts and charms of youth and beauty shall work together upon the same evening and at the same degree of excel-lence, there will be a feast with which no other can be compared." Wagner accomplished this, and herein lies his greatness. But he could not be simply a musician, or a painter, or an actor, or an orator; he had to be all in one, and had he not lived when Science had pushed itself forward to the foreground he could not have achieved what he has. Like the physician, he pressed all the collateral science into service. It was necessary to under-stand the law of the correlation and conservation of forces, and of vibratory motion, together with the laws of light and sound. He had to drink deep of the scientific nectar and feed on the scien-tific ambrosia, and be fully swayed by the scientific bias.

He lived at a time when society, government, the church and medicine had been modified by science. He saw, too, that there are many thoughts and feelings which music can, but which lan-guage is wholly inadaquate to express. With music conceived as simply a tickler of the emotions, he had no sympathy; it was only after he had studied the exact science of counterpoint, that he recognized in music a field for the highest intellectual exer-ercise. The days of emotional music, as well as emotional preaching, are fast dying away, and soon physicians will cease to classify music as basilar, but perceive that it is in the highest degree cerebral—cease to associate it with the passions, but per-ceive in it the light of the most exalted reason. If it had not been for the scientific bias, Shakspere and Goethe and Lessing could never have written; without it Wagner could never have composed. In the choice of themes, too, Wagner was great, for

he selected the classic myths in which he perceived the deep significance underlying, fundamental thoughts constituting a law of the human mind.   But while Wagner clearly perceived the correllation of the fine arts, and that harmony was the connecting link between them, it is doubtful whether he knew enough of the human organism to include medicine among them.   It is possible that he was so much occupied with the branches of fine art, which had a special bearing on the development of the lyric drama that even in his criticisms, he could give no attention to medicine as a fine art, though from the quality of his mind we would be led to suppose that he would be among the first who would be able to comprehend a truth so evident to the physician. But when we consider how other artists of eminence have failed to recognize the relation of medicine to the fine arts, it may be that Wagner also failed to recognize it, and after all, it would not be surprising when we think that until very recently the harmony of the human body was ill-understood, because our knowledge of the mechanism of the nervous system has but just emerged from its infancy.   Heinrich Rolfhs, however, does not hesitate to sharply criticise August von Eye for having failed to include medicine among the fine arts ; and he is right, for it is evident to the more advanced medical mind, which perceives the law of harmony operating in the human organism, and that therapeutics has but a single aim and that to restore harmony when disturbed, that medicine is not only one of the fine arts, but the finest among them, because it has to do with human life.

Article III.

Scarlet Fever in One Family. By Addison H. Foster, M.D.

The last of September, 1882, a child A, aged 11, had a mild throat attack with some fever, so slight I was not called.

October 11, child B, aged 6, became feverish with sore throat and furred tongue.   On the 13th, a scattered, coarse and slightly papular eruption appeared, and by the 15th a well-marked, well-

diffused characteristic scarlet fever rash was developed, and remained a full week, with high fever and coated tonsils.

October 15, child C, aged 9, became feverish, with furred tongue and cankered tonsils, and was quite sick for three days, without any eruption whatever.

October 22, child D, aged 2, was taken like child C, and was sick for three days without any eruption.

November 6, or fifteen days later, child E, aged 4, was taken like the two preceding, quite as severely for three days, but with no eruption, and six days later, November 12, child F, aged 13, had a similar attack, but milder, with no eruption.

Seven days later, on November 19, or thirty-seven days after his first attack, child B had a second attack with less fever and sore throat, but with as well-defined and general scarlet fever eruption as before, which remained about five days.

Twelve days later, on December 1, the child C, aged 9, was taken with fever, sore throat, and well-marked scarlet fever rash, and was sick in bed for a week.

Fourteen days later, on December 15, the child D, aged 2, became sick for a week]with fever, sore throat, and the same kind of eruption.

Thirteen days later, December 27, the child E, aged 4, was taken like the rest, and was in bed for a week with fever, throat trouble and eruptions.

Child F, aged 13, had no second attack.

Child A had a peculiar granular-looking surface upon the swollen tonsils and borders of the palate ever after the first attack until about two months after the second, which finally yielded to direct daily application of tincture of iodine and glycerine, equal parts.

None of the dreaded sequelæ occurred in any of the cases.

The case of the first child I believe to be of specific scarlet fever poison, contracted at school, as child B was not in school. And in this case, as in many other I have seen, the younger ones at home, the least exposed, were the first to develop the disease in all its characteristics.

It is not usual to see a large family come down singly, and at such long intervals. Although we meet variable periods

of incubation in the same household, the disease occurs more frequently in groups, as though two or three had been infected at the same time.

The striking feature of this history is the recurrence of sickness in the same order of individuals as at first; and, that the child A should so soon repeat his eruptions, six months being the quickest repeat in my previous experience.

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ARTICLE IV.

IS CHLORATE OF POTASSIUM IN ORDINARY DOSES EVER POISONOUS?   By E. INGALS, M. D.

In an editorial in the *Medical Record*, of January 13, on "Directions Regarding the Administration of Medicines," we are told that a girl fourteen years old, suffering from follicular inflammation of the fauces, had a mixture prescribed by her physician, of which she was to take a teaspoonful three times daily.   In addition, the physician told her to dissolve two teaspoonfuls of chlorate of potassium in a tumbler of water, and with this to gargle the throat at intervals.   The mother, misinterpreting the directions, gave the potash internally in doses of two teaspoonfuls of the saturated solution four times daily, with an equal quantity of the "mixture."   This would give about eight grains of the chlorate to a dose, or thirty-two grains in twenty-four hours.   Symptoms of poisoning, of which the child died, were developed on the second day.   The statement leaves the impression that poisoning was attributed to the chlorate of potassium.   It would be interesting to know of what the "mixture" that was administered along with it was composed.   I am sure that less than ten grains of chlorate of potassium administered four times daily to a girl of fourteen years, so far from being poisonous, would hardly produce any appreciable effects.   This, however, does not militate against the proposition that the physician should be precise and clear in his directions to both nurse and patient.

Books and Pamphlets Reclived.

Legal Medicine. Tidy. Philadelphia: H. C. Lea's Son & Co., Jansen Mc-Clurg & Co.

Ohio Medical Society Transactions, 36th and 37th annual meetings.

Practical Examination of Urine. Tyson. P. Blakiston, Son & Co.

A Dictionary of Medicine. Quain. New York: D. Appleton & Co

Legal Medicine. Tidy. 2 vols. New York: Wm. Wood & Co. W. T. Keener.

Pocket Therapeutics and Dose Book. Stewart. Detroit: Stewart & Co.

Compend of Anatomy. Roberts. Philadelphia: C. C. Roberts & Co.

Manual of Gynecology. Hart & Barbour. New York: Wm. Wood & Co. W. T. Keener, Chicago.

Treatise on Fractures. Stimson. Philadelphia: Henry C. Lea's Son & Co. Jansen, McClurg & Co.

Diseases of the Ear. Politzer. Philadelphia: H. C. Lea's Son & Co. 1883. Jansen, McClurg & Co.

Early Aid in Injuries and Accidents. Esmarch. Philadelphia: H. C. Lea's Son & Co. Jansen, McClurg & Co.

Treatise on Diseases of the Skin. Hyde. Philadelphia: H. C. Lea's Son & Co. Jansen McClurg & Co.

Diseases of the Liver. Harley. Philadelphia: P. Blakiston, Son & Co. W. T. Keener.

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Dr. R. G. Bogue has been appointed by the Cook County Commissioners one of the surgeons to Cook County Hospital. This selection is highly creditable to the Board, and if Dr. Bogue accepts, the medical students and the patients will have an able and conscientious practitioner and an eminently practical teacher.

Dr. E. S. Pettijohn, of Chicago, has been appointed second physician to the Eastern Hospital for Insane at Kankakee, to fill the place made vacant temporarily by absence of Dr. H. M. Mayer.

Selections.

ABSTRACT OF LETTSOMIAN LECTURES ON THE TREATMENT OF SOME OF THE FORMS OF VALVULAR DISEASE OF THE HEART. Delivered before the Medical Society of London. By ARTHUR ERNEST SANSOM, M.D. Lond., F.R.C.P., Physician to the London Hospital, Senior Physician to the North-Eastern Hospital for Children.

LECTURE II.—MITRAL REGURGITATION. *Morbid Anatomy— Clinical Study—Regurgitation in Adynamia, in Acute Fevers, in Rheumatism and in Degeneration—Treatment General and Special—Action of Digitalis, Belladonna, Caffeine, Convallaria majalis, etc.*

I have to ask your attention this evening to the subject of the treatment of various conditions of disease associated with a certain imperfection in the mechanism of the heart—an imperfection of closure of the left auriculo-ventricular orifice at the time of systole, occasioning the reflux of a portion of the contents of the left ventricle into the left auricle, the mitral valve being inadequate to close the orifice. Pathological anatomy teaches that such result may be brought about by several varieties of morbid change :

1. By dilatation of the left ventricle without structural disease of the valve ; so the free borders of the curtains are drawn upon by their circumferential attachments, and prevented from a perfect apposition in systole.

2. By diseased conditions of the valve-curtains, the tendinous cords and fleshy columns, induced by endocarditis, and the changes consecutive thereto.

3. By rupture of the valve-curtains, cords, or columns, and

their consequent incompetence. It has been supposed that rupture may occur from sudden strain in a healthy heart, but Drs. Wilks and Moxon have given strong reasons for the conclusion that there must have been some dilatation, at least, of the left ventricle previously. They consider that this accident is not of infrequent occurrence.

4. By atheromatous disease, patches of which may be observed upon the valve with consecutive degenerative change, rendering it inadequate.

5. By ulceration of portions of the valve and the surrounding structures.

Mitral regurgitation is not, however, wholly to be interpreted by pathological anatomy; it is to clinical investigation that we must chiefly look for guidance. Of this condition, a murmur at the left apex of the heart with the systole is the sign almost, though not quite, pathognomonic. The only condition with which it is likely to be confounded is, in my opinion, pericardial roughening at or about the apex. I have never known a difficulty about the differential diagnosis in the case of adults, but I have observed such difficulty several times in children. In cases of children I have repeatedly said that the quality, character, and situation of a systolic apicial murmur will not declare with precision whether there be exocardial or endocardial disease. Combined clinical and necroscopic observation soon convinces us that, in certain cases, wherein we have determined from such physical sign that mitral regurgitation existed during life, no lesion indicating inadequacy of the mitral valve to close its orifice has been discovered after death. Moreover, in some cases, where we have not only observed the sign mentioned, but where the whole category of signs, symptoms, and consecutive changes which experience has taught us to associate with mitral inadequacy has been present, the necropsy has demonstrated no determinate lesion at the orifice.

It will best serve a practical purpose, I think, if we divide the cases in which the signs indicating mitral regurgitation are evident into clinical groups, discussing the bearing of the collateral phenomena upon treatment in each group. We shall thus consider the cases just as we meet with them in practice.

I.   A case presents itself, manifesting signs indicating mitral regurgitation in the subject of marked anæmia.   We have to inquire whether or no there has been antecedent disease, leading up to organic change at the mitral orifice.   Supposing such signs are not in evidence, have we a right to assume that actual mitral regurgitation can be induced by the condition of anæmia without concurring causes?   The answer is, in my opinion, undoubtedly in the affirmative.   In cases of anæmia and chlorosis, a murmur is sometimes heard exactly in the site of that indicating mitral regurgitation.   Assuming that, in these cases, there is a veritable regurgitation, how is such brought about?   The explanation, is, I think, given by the careful experiments conducted by Ludwig and Hesse at Leipzig, which have been admirably summarized by Dr. Donald Macalister (Remarks on the Form and Mechanism of the Heart).   The mechanism for the closure of the left auriculo-ventricular orifice does not reside in the valve-curtains alone ; the surrounding muscles of the ventricle have an active share, not merely in floating up the valve-curtains, but in reducing the size of the aperture which these valve-curtains have to close.   It is not that the orifice is dilated, but that it is insufficiently contracted, the aid of the muscles of the wall of the ventricle which normally produce such contraction being lost.

It is important, in regard to treatment, to differentiate mitral regurgitation due to disease of the valves, from that due to adynamia of ventricle, supposing a systolic-apicial movement to be manifest in a markedly anæmic subject.   The two signs I would most rely on as pointing to an anæmic causation of the murmur are (1) an absence of notable cardiac dilatation ; (2) a heightened tension in the systemic arteries.   I have never known in these cases any marked improvement follow the administration of the usual cardiac tonics, such as digitalis and iron.   In the cases attended with hæmorrhage, it is, of course, of the first importance to arrest this at its source.   Rest, and the administration of assimilable food, are no less important indications.   In this connection, I may call attention to the great value I have observed to attach to supplementary alimentation by the rectum in such cases.   I have long tried the plan of using defibrinated ox-blood for a nutrient enema, as advocated by my friend Dr. A.

H. Smith, of New York. In comparing results, however, with those in which artificially digested food has been employed, I felt that the balance of evidence is in favor of the latter plan. I have had prepared mixed peptone enemata—beef, milk, and farinaceous food—which have been proved to preserve a perfectly good condition for long periods. These have the advantage of being available at a moment's notice, it being only needful to render them diffluent with warm water. From two to four ounces are injected slowly into the rectum, and repeated every three or four hours. In many cases, I have caused to be added the dry ox-blood (sanguis bovinus exsiccatus), in the proportion of a drachm to the ounce. I have lately, however, adopted a simpler plan with good results; using, instead of peptoned food, equal parts of warm milk and cod-liver oil, as a nutritive enema. In the treatment of cases of idiopathic anæmia, I have found no drug-treatment so efficient as the administration of arsenic (Fowler's solution in small doses gradually increased). I have observed, as has been recorded by others, complete recovery, with the disappearance of the cardiac murmur, under such treatment, combined with rest and careful nutrition.

II. We will now assume that a systolic apex-murmur is pres. ent in a patient showing signs of *a neurosis of the cervical sympathetic*. It has been frequently noted that a murmur at the apex has existed in the subjects of exophthalmic goitre (Graves's or Basedow's disease); yet, on post mortem examination, no disease at the mitral orifice has been discovered. In these cases, anæmia may be present, but not of necessity. It is not causally related with the phenomena. Organic heart-disease may coexist, but such coincidence is rare. It is important to recognize, especially with regard to treatment, that, in the subjects of Graves's disease, mitral regurgitation occurs without valvular lesion. The record of fatal cases in which disease of the cervical sympathetic ganglia has been actually demonstrated in Graves's disease, is now tolerably extensive. Trousseau, Cruise, and McDonnell, Reith, and Shingleton Smith, have recorded cases in which some of the ganglia (usually the inferior cervical) have been enlarged, atrophied, or degenerated.

As regards the cases which I have seen, ordinary tonics and

digitalis have been of very little benefit; but great improvement
has followed galvanization of the cervical sympathetic. I have
employed the continuous current, from twenty to forty elements
(Leclanché). One pole may be placed behind the lower jaw in
front of the sterno-mastoid, and the other either at a correspond-
ing point of the opposite side or at the nape of the neck, right
or left of the vertebra prominens, or above the sternum at the
inner edge of the insertion of the sterno-mastoid.

    III. I now turn to a third group of cases, and assume that
the indications of mitral regurgitation are manifest during the
evolution of certain fevers. In the course of typhoid fever, for
example, a systolic murmur may be discovered at the apex.
There is no history of its existence before the attack, but it has
arisen during the course of the disease. The murmur is an
evanescent one. To what is it due? The changes are, accord-
ing to M. Hayem's observations, not in the endocardium nor
pericardium, but in the muscle of the heart. In fatal cases, the
muscular fibers present a granular and fatty degeneration, or a
special form of vitreous degeneration; the areas of morbid
change are disseminated in an irregular manner here and there
throughout the cardiac muscle. There are, besides, a multipli-
cation of the muscular nuclei and aggregation of cellular
elements; in fact the disease is a form of myocarditis. It is, I
think, sufficiently proven, that the murmur occasionally heard
at the apex in cases of typhoid is due to regurgitation, on account
of imperfect apposition of the valves of left or right sides from
enfeeblement, by disease, of the muscular fibers in certain areas
of the heart wall. It does not appear that the occurrence of
such murmur renders the prognosis more grave, but sudden
death from myocarditis in all probability may occur in typhoid,
without any special evidence of direct cardiac impairment
previously. Its occurrence, however, should make us watchful,
and cases presenting any of the phenomena indicating myocardi-
tis in typhoid should be observed and treated with a view of
preventing subsequent dilatation. Analogous myocarditis has
been described in variola (by MM. Desnos and Huchard), and
in severe forms of intermittent fever as observed in Africa (by
M. Vallin).

It is obvious that a recognition of the nature of the alteration which produces a mitral regurgitant murmur in these cases must have an important bearing on treatment. We need not fear that endocarditis has arisen as a complication, nor have we to debate as to an anti-rheumatic plan of treatment. The indication is to keep the disturbed muscle of the heart as tranquil as possible, and, of course, to promote as good a nutrition as the circumstances will permit.

IV. I now come to the fourth group, and assume that a murmur indicating mitral regurgitation is observed in the subjects of *acute or subacute rheumatism.* Attention has been frequently drawn to the fact that murmurs may arise in the course of evolution of the disease, and yet disappear, and patients may be supposed to be free from cardiac complication. I have, in my former lecture, deprecated this as a too hasty conclusion. It may be well to inquire, in the first place, what is the probable nature of these transitory or evanescent murmurs, which are by no means uncommon, for they occur, as the statistics of the London Hospital for 1880 and 1881 show, in about 10 per cent. of the cases. Rheumatism is a disease notably attended with anæmia. The evidence collated for me by Dr. Gabbett as to the site of such transient murmurs is, I think, against this view. It is well known that the murmurs heard in connection with anæmia, though sometimes heard at the apex, and indicating mitral regurgitation, are far more frequently audible at the base over the site of the pulmonary artery or aorta; even when heard at the apex, they are usually accompanied by other murmurs at the base. In rheumatism, however, the usual site of the evanescent murmur is the apex. The totals for 1881 show as follows: Transient murmurs in mitral area, 15; at base and apex, 7; in aortic area, 5; in pulmonic area, 3.

It would appear that a murmur which might suggest an anæmic causation is almost confined to a first attack of rheumatism. After two or more attacks, no basic transitory murmurs are recorded. Then, as regards the transient systolic murmur in the mitral area, we may ask whether it may be due to myocarditis. If so, it does not resemble in associated phenomena the murmur observed in typhoid, etc. The peculiar perturbations

of rhythm are not recorded, and it would appear probable that, if there be myocarditis, it does not occur in disseminated areas as in typhoid. May it not be that the temporary regurgitation is due to a localized myocarditis developed in the neighborhood of a swollen valve or inflamed endocardium? Thus, though the swollen valve might not be in itself incompetent, a temporary incompetence would be produced by the impairment of the force of the muscle. As the myocarditis subsided, the valve would again become competent, but probably, in many instances, to present a renewed imperfection when the swelling, in the course of time, has given rise to fibrous change and consequent shrinking. I draw attention to this as a caution as to the expression of any opinion that a valve is sound after a murmur developed during the early stages, and disappearing during the latter period of rheumatic fever.

Supposing that mitral regurgitation is left after rheumatic endocarditis, it is well known that compensation may be effected, and the health of the patient be preserved for very long periods with no subjective symptom of cardiac unsoundness. The chief factor in inducing such compensation is a (conservative) hypertrophy of the right ventricle, and the sign of such compensation (supposing the amount of blood regurgitating to be not very small) is an accentuated second sound over the pulmonary semilunar valves. If we are satisfied that there be due compensation, medicinal treatment may be entirely unnecessary. I have no doubt that a vast amount of injury has been done to patients by a shaking of the head of the auscultator over the subject of a mitral murmur, who perhaps was no worse at the time of examination than he was ten, twenty, or thirty years before, and who might continue uninfluenced for harm by his cardiac complication all his days. He should be cautioned against strain, exposure, irregularities of diet, etc.; he may be better occasionally for treatment by iron tonics, cod-liver oil, or strychnine, but any special cardiac treatment is out of place.

Not so, however, if there be evidence that compensation is beginning to fail. I will pass in brief review the chief agents which are of service in such case.

I. Digitalis is *facile princeps* of drugs in the treatment of

imperfect compensation. A little over a suitable dose, however, may induce nausea, vomiting, anuria, irregularity of pulse, and, instead of slowing, an enhanced rapidity of heart-action. Whilst a dose which produces favorable result is constant and discoverable, in regard to a large majority of patients, in a minority, such dose is inconstant and even unattainable.

As regards the preparation used, we may have differences of results, and we know that, as in the case of so many vegetable products, the energy of different samples may vary. Practically, I consider the tincture most reliable, and that usually in small doses, five minims to ten minims, increased only in exceptional cases, and then occasionally reduced; next in value I considered the powdered leaves (half a grain to two grains) the combination of which with alkalies I shall hereafter consider.

In some cases, even by increasing the dose, no apparent influence appears to be exerted by the drug; then digitalis, especially when hypodermically injected, I have observed to give, in many cases, good results. The digitalis hitherto prepared has probably scarcely ever been the pure alkaloid. The usual dose for hypodermic administration is one-fiftieth of a grain.

When the right ventricle has dilated so far that there is marked tricuspid regurgitation, the beneficial action of digitalis is by no means so decided. Nevertheless (especially when purgatives are also administered), the signs of tricuspid regurgitation may pass away. In other cases, no such favorable result attends. In fact, as à priori considerations might suggest, any increased force of systole which the digitalis may bring about serves the more to urge back the blood through the imperfect tricuspid orifice into the venous channels. But yet I have seen good results when the administration of digitalis has been combined with abstraction of blood by leeches or cupping to relieve venous engorgement.

II. Belladonna is, I think, only useful in the treatment of failure of compensation in cases of mitral regurgitation, when combined with, or occasionally substituted for, digitalis. Belladonna, like digitalis, increases the power of systole and raises the arterial tension. As Dr. Lauder Brunton has shown, it paralyzes the cardiac terminals of the vagus, and reduces irritability by an anæsthetic effect on the sensory nerves of the heart. Very useful

occasionally, it by no means compares with digitalis for prolongd employment.   The hypodermic injection of one-fiftieth of a grain of digitalis with one-eightieth of a grain of atropine I have found very satisfactory.

III.   Casca.—A tincture made from the bark of the ordeal bark of West Africa has been employed as a substitute for digitalis.   Dr. Lauder Brunton, in his Gulstonian Lectures for 1877, published the results of elaborate experiments as to its physiological action.   In kind, this action appears much to resemble that of digitalis.   Dr. Brunton has said: "Digitalis has hitherto been our great resort in mitral disease, but I think it probable that in casca we possess a drug more powerful still; at least, its effect upon the arterioles appears to be greater than that of digitalis, and it is quite possible that it may succeed in those cases of advanced mitral disease where digitalis fails."   I have myself employed the tincture of casca, substitutively for digitalis, in a considerable number of cases, but I have never yet been able to convince myself that it has any more beneficial action in mitral disease.

IV.   Caffeine.—Gubler, Shapter, Leech, Milliken, Brakenridge, Huchard, and others have recorded observations showing the action of caffeine (or its citrate) in cases of cardiac disease, especially where dropsy is a marked symptom.   Some of the cases show very forcibly that a beneficial influence has been exerted by the drug.   There are many apparently contradictory data as to the physiological action, but the cardinal points are, that it at first quickens, but soon after slows the heart's action, and that it acts in a very pronounced manner as a diuretic in cardiac dropsy.   Dr. Brakenridge advises that digitalis be administered previously to or in conjunction with the citrate of caffeine, and that small doses (three grains) should be employed.   M. Huchard, however, recommends that caffeine and not its citrate should be used, and that in larger doses (four to six grains).   It produces diuresis more rapidly than digitalis, and has none of its nauseating effects. I have employed citrate of caffeine in substitution for digitalis without any marked benefit being manifest; indeed, I have found that in some cases it has induced insomnia.   Nevertheless, I consider that the evidence is such that I should certainly employ it

in many cases where, as in cardiac dropsy, a rapid diuretic effect is desirable.

V.   Convallaria majalis.—This is the well-known lily-of-the-valley, long employed by the Russian peasantry as a remedy for dropsy.   Professor Sée has shown that it has an action much resembling that of digitalis.   An extract of the whole plant is employed in doses of from five to eight grains, three times a day. In cases of mitral regurgitation with severe symptoms, it entirely relieved the cardiac distress, and manifesting a decided diuretic action, removed the dropsy.   Professor Sée considers that it may be used in all forms of heart failure, for it has none of the nauseating effects of digitalis, nor does it exhaust the contractility of the heart and arteries.   I have employed it as a substitute for digitalis, and am convinced of its action in promoting a stronger ventricular contraction ; but I am not yet convinced of its superiority to digitalis.

VI.   Morphia.—The hypodermic injection of morphia, as advocated by Dr. Clifford Allbutt, is a most valuable adjunct to the treatment of failure of compensation in cases of mitral regurgitation.   I have found preparations of opium by the mouth generally disagree, but not so when the alkaloid is hypodermically injected.   It is often very advantageous to combine the morphia with atropia or digitaline.

V.   By no means all the cases which come before us showing mitral regurgitation are to be explained by the modes of causation we have hitherto discussed.   In a considerable minority, such regurgitation is secondary to combined high tension in the aorta and arteries.   It is important for prognosis and treatment to discriminate the cases of *mitral regurgitation due to heightened arterial tension.*   In such, the apicial murmur is usually post-systolic, the signs of hypertrophy preponderate, the patient is usually, though not always, of middle or advanced age, the advent of signs has been gradual ; often the arteries may be observed to be tortuous and hard.   The most important signs however, are the discovery either of aortic disease, or of accentuation of the aortic second sound, with pulse of high tension. Chronic renal disease may be also manifested.   When not so complicated, great improvement often follows a prolonged treat-

ment by alkalies with iodide of potassium. A carefully regulated diet is most important, and those cases do best, I am convinced, who entirely abstain from alcohol. It is by no means infrequent to find a murmur of regurgitation brought about by such causes wholly disappear. Their epiphenomena are often to be successfully treated by the administration of nitro glycerine, or the inhalation of nitrate of amyl.—*British Medical Journal.*

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OBSERVATIONS ON THE MANAGEMENT OF ENTERIC FEVER ACCORDING TO A PLAN BASED UPON THE SO-CALLED SPECIFIC TREATMENT, BY JAMES C. WILSON, M. D., Physician to the Jefferson Medical College Hospital, and to the Philadelphia Hospital. (Read January 3, 1883.)

I desire to lay before the College a plan of managing enteric fever, which I have employed during the past year and which, tested by such uncertain but not necessarily fallacious means as are available for a limited series of cases, has yielded satisfactory results.

The object of this communication will, I believe, be best attained by first sketching in outline the plan of treatment itself; next, by reviewing the considerations which led to its adoption, and finally by a brief study of the cases. This arrangement of the topics will enable us to economize time.

The Plan of Treatment.—The scope of this paper, and the necessity to be brief, debar me from the consideration of the general management of the patient, dietetics, the treatment of complications and sequels and of the prophylaxis; and restrict me, in the main, to the subject of the management by medicinal means. It is, in fact, this part of the treatment that, super-added to so-called rational and expectant method in general use in this community, differs from the common practice and constitutes the plan in question.

So soon as the patient is found to have enteric fever, or, in many instances, so soon as his symptoms warrant a reasonable suspicion that he is about to develop it, he is put to bed, ordered

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a diet consisting of milk, animal broths, jelly and simple cus-
tards, in small amounts, and at intervals of two or three hours.
At night he is given a dose of calomel. This dose varies in
amount from $7\frac{1}{2}$ to 10 grains (0.5 to 0.66 gramme) and is re-
peated every second evening until three or rarely four doses have
been administered in the course of the first six or eight days. It
is given alone or in connection with sodium bicarbonate. There
is commonly a slight increase of diarrhœa, if it be present, without
aggravation of the other symptoms, and in some instances the ten-
dency of the temperature at this time to steadily rise, appears to
be controlled. If, as is frequently the case, spontaneous diar-
rhœa has not recurred in the first week, the calomel usually
brings about two large evacuations on the day following its
administration, not more. In either case the tendency to fre-
quent passages in the later stages of the attack is favorably influ-
enced by the repeated administration of this drug during the first
week. If the case does not come under observation until after
the tenth day, one only, or at most, two doses of calomel are given.
No further doses of it are, however, given during the course of
the attack unless constipation occurs. In this event, if the evi-
dences of extensive or deep implication of the intestinal wall, such
as abdominal pain, tenderness or marked tympany are absent,
calomel in $7\frac{1}{2}$-grain (0.5 gramme) doses is given at intervals of
three or four days. If there is reason to suspect serious intes-
tinal lesions, the lower bowel may be more safely emptied of its
contents every third or fourth day, by enemata of moderate size
(8 to 10 fluid-ounces). It is necessary to bear in mind that the
gravest lesion of the gut leading even to hæmorrhage and perfora-
tion, have occasionally been observed in cases characterized, not
only by constipation, but also by an entire absence of pain or
tenderness, and very moderate tympany. The danger of saliva-
tion from calomel in these doses in enteric fever appears to be
slight. In only one case in sixteen were the mercurial fetor and
slight swelling of the gums observed.

Excessive diarrhœa has been controlled by the use of opium,
either in suppositories, containing 1 grain (0.06 gramme), or by
the mouth in quarter-grain (0.016 gramme) doses, often associated
with bismuth, and given *pro re nata*. It is an invariable rule

that the patient be kept in the horizontal position and to the use of the bed pan and urinal, from the time of the recognition of the disease until defervescence is completed. He is, however, turned upon his side from time to time, and made to maintain that position for twenty or thirty minutes, if necessary, being supported by the nurse.

From the beginning of the attack the following mixture is regularly administered in doses of one, two, or even three drops in a sherry-glassful of ice-water after food, every two or three hours during the day and night :

    ℞.   Tinct. iodinii, f℥ij....................8 | 00 c. c.
           Acid. carbolici liq., f℥j..............4 | 00 c. c.
           M.

Unless some unusual circumstance occur to render a change necessary, this medicine is not suspended until the attack draws to a close. It is well borne by the stomach and excites no repugnance on the part of patients. In one case only has it been necessary to omit the carbolic acid on account of the disgust assumed by its odor.

Partly for the sake of its favorable influence upon the skin and for the sake of cleanliness, partly because of its favorable though slight influence upon the temperature, the patient is to be sponged twice a day with equal parts of aromatic vinegar or alcohol, and cold water. If it is more grateful to him, this sponging may be done in tepid water, the evaporation of an extensive film of water not below the temperature of his body probably being not without a refrigerating tendency.

When the evening axillary temperature reaches 104° F. (40° C.) quinine in massive doses, 24 to 30 grains (1.66 to 2.00 grammes) is given upon a falling temperature. I usually direct 8 to 10 grains to be given in solution at 5, at 5.30, and at 6 A. M. the following morning. Administered thus at the decline of the temperature in its diurnal revolution, these large doses of quinine depress it from 2.5° to 3.5° F. (1.4° to 1.8° C.). After the lapse of forty-eight to seventy-two hours, if necessary the dose may be repeated. If these doses be rejected by the stomach—an unusual circumstance—half the quantity of quinine may be administered hypodermically. For this purpose a citric

acid solution is to be preferred.   Since the adoption of the plan
of treatment under consideration, I have not encountered cases
attended with such hyperpyrexia as has rendered attempts to
control it by cold baths necessary or even advisable.

The minor nervous symptoms are best held in check by skillful
nursing.   For the relief of the headache of the first ten days, abso-
lute quietude, a dim light, etc., are often sufficient; occasionally
the bromides alone, or in combination with chloral are required.
Later in the course of the disease chloral is unsafe.   From the
end of the first week the patient cannot be left unattended even
for a few minutes, without risk.   Persons in whom delirium was
only occasional and transient, have in many instances destroyed
themselves during the momentary absence of the nurse.

Alcohol is not often indicated prior to the beginning of the
third week.   It may, however, by reason of the habits of certain
patients, be necessary throughout the attack.   Although form-
ing no essential part of the treatment, it is commonly adminis-
tered in varying though usually small amounts towards the close
of the sickness.   Some patients do well without taking it at all.
It is of course administered in accordance with well-understood
indications upon the supervention of delirium, ataxic symptoms
and the evidences of failures of the forces of the circulation.
The patients are carefully watched well into convalescence, and
cautioned against too soon regarding themselves restored to
health.

The dangers of the establishment of a focus of contagion are
guarded against by the systematic, thorough disinfection of the
stools immediately after they are voided.

The considerations which induced me to adopt this plan of
treatment indicated in the foregoing sketch, are:

1. A feeling of dissatisfaction regarding the expectant method
of treating enteric fever.   This feeling, vague at first, grew more
definite and stronger with increasing clinical opportunities, and
a fuller knowledge of the natural history of the disease, until it
became a motive, impelling me to cast about for some different
and more satisfactory plan.   This feeling has been during the
past decade, a very general one in the profession in all parts of
the world, as is attested by an almost endless succession of jour-

nal articles setting forth new plans of treatment, and the use of new drugs in the management of this, the most common and most important of the acute infectious diseases of the present epoch in medical history. Most of the plans thus suggested have led to disappointment when tested by the fuller observations of the profession ; many of them have failed to attract general attention, and some few are still *sub judice*. Their number and diversity bear witness to a wide-spread distrust of the once well-established expectant treatment. This distrust is, however, based upon something more tangible than a mere feeling of dissatisfaction. The statistics of all observers whose cases have been sufficiently numerous to be trustworthy, show enteric fever to be, when treated by the expectant plan, a disease of high death-rate.

The percentage of fatal cases rarely falls below 15 per cent., and often exceeds 25 per cent., according to the hospital records of this country, Great Britain, and Continental Europe. Jaccoud, with a collection of 60,000 cases, observed a mortality of 20 per cent.; Murchison, in 27,051 cases, 17.45 per cent.; Leibermeister, in 1,718 cases, at Basle, under an expectant plan, records 27.3 per cent. of deaths. But turning from broad generalizations to personal experience, who is there here that, many times elated by the happy issue of mild or average cases treated by the expectant plan, has not realized the sense of utter powerlessness attending it when he has stood face to face with cases in which *to do* rather than *to wait*, has been necessary to save life ?

2. Enteric fever is the very type of the general diseases, of affections *totius substantiæ*. The tissues are universally implicated in the morbid processes ; no function of the body wholly escapes perturbation. For this reason, plans of treatment suggested by the prominence of certain groups of symptoms, or by the known lesions of particular organs, even though of undoubted benefit as far as they go, are in theory unsatisfactory, because they are directed in effect against conspicuous manifestations of the cause of the sickness rather than against the cause itself.

Whilst in actual practice, the treatment by turpentine, by alcohol, by opium with lead, or the silver nitrate, or by agents capable of controlling the febrile movement, as quinine, digatalis,

salicin, and the salicylates, even the cold-water treatment itself, although at times, and in the hands of certain clinicians showing favorable results—all these have failed of general acceptance on the part of the profession.

3. The general character of the disease, the specific nature of its cause, the unsatisfactory results alike of an expectant and of a symptomatic plan of treatment, or rather of the two combined, have united to render the idea of a specific treatment, a true cure for enteric fever, a most attractive one, to stimulate thoughtful observers to renew again and again the disappointing search for it.   To this idea may be traced the treatment by the mineral acids, by chlorine-water, by carbolic acid, by quinine alone, by quinine and digitalis, by iodine, by the potassium iodide, by calomel.

4. No only is the conception of a specific treatment for specific diseases a most attractive one, and the attainment of such a treatment for enteric fever brought within the bounds of a reasonable hope by the analogy of syphilis and the malarial diseases, but the search after it with due caution and judgment, has also the warrant of the very highest medical authority.

Passing by some earlier names, I refer to Da Costa, who has said : " It would be as illogical as absurd to suppose that we shall never possess the coveted means really to cure the continued fevers.   Doubtless, to the physicians of the time of Charles V., the radical and specific treatment of the malarial fevers appeared as hopeless and remote as the radical and specific treatment of the continued fevers appears to the scientific inquirer of our day."

I refer also to Liebermeister, who, treating about 800 cases, part with calomel, part with iodine, had, with the former drug, a mortality of only 11.7 per cent., with the latter of 14.6 per cent., against 18.3 per cent. for cases treated without those remedies, but in other respects upon a similar plan.

Bartholow has also spoken in favorable terms of the treatment by iodine in combination with carbolic acid.

The treatment adopted is thus seen to consist of the use of the two remedies that are proved to exert a favorable influence upon the disease, iodine and calomel, with the addition of carbolic acid in minute amounts.   I am aware that no positive conclusions as

to the efficacy of particular plans of treatment can be deduced
from a limited series of cases.   I am also aware that few acute
diseases show greater variations in intensity and in the percentage
of mortality at different periods, and under different circumstances,
than enteric fever.   Nevertheless, I have ventured to occupy your
attention with this subject to-night, because the results of the
treatment encourage me to hope that its discussion in this way
will lead to its trial on a more extended scale.   That it amounts
to a specific treatment in the narrow sense is not affirmed.   It is
tentative, provisional, but it is, nevertheless, to be regarded as a
contribution to the subject of the specific treatment of enteric
fever.

The total number of cases treated by this plan is sixteen; all
recovered, one being now in the second week of convalescence.

Of these, eight were severe, the temperature reaching or ex-
ceeding 104° F. (40° C.).

Of these eight severe cases, one was characterized by uncon-
trollable vomiting in the third week.   The patient retained no
food taken by the mouth for five consecutive days.

One case was very irregular in its course, and was complicated
by an obscure abdominal abscess which discharged by the bowel.
The temperature in this case on two occasions attained 105° F.
(40.5° C.).   This case presented the characteristic eruption of
enteric fever.

A third case was prolonged by a severe relapse.

Of the eight cases in which the observed temperature did not
at any time attain 104° F. (40° C.), and which was therefore
looked upon as medium or mild cases, one was complicated by
crural phlebitis, and another by the occurrence of intestinal
hæmorrhage.

The average duration of the eight severe cases was about 31
days; that of the eight mild and medium cases was about 25
days.

Of the whole number ten were treated in hospital, six in pri-
vate practice.   All from the time of their coming under observa-
tion were under my personal care.

In two cases the special plan of treatment was abandoned
about the beginning of the third week on account of the super-

vention of unusual symptoms of great gravity. These related respectively to gastric irritability and an obscure abdominal abscess.

These sixteen cases are unfortunately not a consecutive series. During the year in which I have had the opportunity of observing them, two other cases of enteric fever have occurred in my hospital practice in which this plan of treatment was not employed. One was that of a man suffering from rheumatism, who, after a stay of several weeks in the wards, and in a bed near that occupied by a patient very ill of enteric fever, was observed to be febrile, and to have the typhoid eruption. This person, previously greatly reduced, was not regarded as a suitable subject for a special treatment, the efficacy of which was not yet established in my mind. The other was a man, who, with an obscure history of a sickness of many weeks, and a very irregular temperature, developed the typhoid eruption, and within forty-eight hours had general peritonitis. These two fatal cases have however no bearing upon the result of the treatment.

In private practice several cases of mild continued fever of long duration were treated upon this plan during the past winter. I believe them to have been anomalous cases of enteric fever, but as the rose spots of that disease were absent, and their departure from the typical disease was wide, I have not included them in the above collection of cases treated. They all recovered.

The result of this plan of treatment has not only been satisfactory in respect of the recovery of all the cases treated, an accidental circumstance not liable to mislead persons familiar with the disease, but it has also been satisfactory in respect of the general course of the attack, and the appearance of the patient. These were in the main, despite the severe type of the disease, in several of the cases and despite the occurrence of grave complications, favorable. I make this statement with due regard to the personal equation, and with no willingness to permit the observed fact to differ from the actual fact, for I desire any who may make trial of this plan to be more favorably impressed with the results of it, than they have been impressed with my account of it.

[After the reading of the preceding paper :—]

Dr. George Hamilton spoke of the great importance of preventing hypostatic congestion by changing the position of the patient from time to time. This was one feature of the plan of treatment recommended some time ago by Dr. Wm. Pepper, in typhoid fever, by which he obtained the unequalled result of 98 per cent. of recoveries. He was not, however, at this time able to recall in detail the method of treatment.

Dr. J. T. Eskridge stated that the treatment to which Dr. Hamilton referred consisted in the administration of nitrate of silver, and was that which had been introduced by the late Dr. J. K. Mitchell some years ago.

Dr. Roberts Bartholow said that the plan of treatment of typhoid, advocated in the very interesting and able paper just read, is, as all present probably know, in part, the so-called " specific " method. The administration of calomel in full purgative doses during the first week serves a double purpose : it has an effect on the range of temperature, and it acts on the typhoid germs present and multiplying in the intestinal canal. The use of iodine—usually Lugol's solution—throughout the disease, is also one mode of the specific treatment. By the use of this medicine, it is attempted to prevent the multiplication of germs in the intestine, to check fermentation, and to maintain an antiseptic action in the blood.

Although the existence of typhoid germs has not been proved, it must be regarded as possible. Klein, a few years ago, announced the discovery of the specific organism of typhoid in the affected intestinal glands, but Creighton of Cambridge, showed that the supposed germs were produced by the mode of preparation. This *fiasco* threw great discredit on the whole question of germs. Nevertheless, the course of treatment directed against supposed germs—the antiseptic method—has had a most favorable influence on the progress and mortality from typhoid. Whilst the specific plan has been advocated in Germany, the Montpelier school have brought forward carbolic acid as the remedy, and the success which has attended the use of this remedy has been really remarkable. Quite a different complexion has been put on the statistics of mortality since they began the use of carbolic acid.

It is probable that the combination of carbolic acid and iodine gives better results than the use of either singly. According to my observation, this method of treatment diminishes the diarrhœa, lowers the fever, and renders the disease much less violent, consequently lessening the mortality. Dr. Wilson has, therefore, rendered us a real service by drawing attention anew to this plan of medication, and especially by supporting his position with valuable cases and statistics. Besides this use of medicines, Dr. Wilson's treatment contains many valuable suggestions and practical methods, which, no doubt, contribute materially to his success.

Dr. J. M. Da Costa spoke of the purgative treatment in enteric fever, as that which has been tried in the French Hospitals and for a time sanctioned by Louis. As regards calomel it was partly by its purgative action that it was supposed to be beneficial. In his hands the calomel treatment had not yielded favorable results. He had found carbolic acid useful in controlling diarrhœa and in lowering the temperature. He had also employed thymol in one-half to one grain doses. He suggested the use of this remedy in the place of carbolic acid, as more acceptable to the stomach.

Dr. Wilson, in reply to the question of Dr. Hamilton, said that he considered it necessary to frequently change the position of the patient to prevent pulmonary hypostasis. He had intended to emphasize this point in his paper. He called attention to the fact that carbolic acid and like drugs probably exert a favorable influence upon the course of enteric fever by their power to stay the rapid decomposition of the intestinal contents, which, for lack of the antiseptic influence of the intestinal juices, the bile, etc., all of which are changed, is a secondary cause of irritation, diarrhœa and tympany. Calomel also, he thought, probably exerted an indirect beneficial influence in the same direction.

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Dr. H. M. Mayer has been commissioned by Governor Cullom to make an official report on his return from Europe, upon foreign lunacy management.

THE THERAPEUTIC VALUE OF CEPHALIC AND SPINAL ELECTRI-
ZATIONS.* BY G. H. HUGHES, M.D., ST. LOUIS.

The physiological experiments of MM. Latournian and
Laborde (*Gazette Hebdominaire*, 1879), confirmed by those of
MM. Condorceau and Duval, performed on inferior animals,
have fully demonstrated the power of electrizations to produce in
the brain a state of temporary anæmia immediately following
each application.   But these demonstrations were only confirma-
tions of a fact previously ascertained by clinical methods.   M.
Latournian having himself before reported the case of the Abbé
C., whose brain, chronically congested to such a degree as to
produce marked and grave psychical aberrations, yielded favora-
bly to persistently repeated cephalic electrizations, and I had
myself, long before this, employed these applications for this
purpose, and became convinced, from repeated experience, of
their power over the brain to tranquilize and subdue cerebral
excitation, and over the vasomotor system to promote through
them the contraction to normal dimensions of the abnormally
distended cerebral arterioles in hyperæmic encephalic conditions.

Though the precise mode of action of the constant current in
destructive brain lesions will probably not be understood until a
number of cases, which have been treated in a similar manner,
have been investigated post mortem, as Althaus says, is perhaps
true ; yet we now understand its modus operandi in cerebral con-
gestion quite well, and in this knowledge we have, in part, doubt-
less, a comprehension of how it may act in arresting, if not in
diminishing, the growth of morbid products within the brain.
The diminished caliber of the cerebral vessels may be inimical to
their development, and the same influence that restores normal
vasomotor tonicity, may extend itself to the trophic and absorbent
systems.

In the beginning of 1878 it had become quite a routine practice
with me to so employ the constant galvanic current, and I have
the records of a number of cases of induced cerebral hyperæmia,

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* This paper was read before the Association of Superintendents of American Institutions
for the Insane, at Toronto, Canada, June 14th, 1881, some of the clinical records being then
briefly detailed verbally.

one of them a case of *meningitis verticalli*, which occurred in a late general of the army, as the results of a saber wound received in battle, in which the effects of repeated applications of this valuable therapeutic agent were most salutary. Since then I have extended the employment of the constant current to all well-marked congestive states of the cerebro-spinal nervous system, and to parts so involved, and intimately associated with the sympathetic system.

We may say, before passing to the record of our cases, that a now somewhat extended observation in electro- and neurotherapy seems to confirm what Löwenfeld deduced from experimental galvanization of rabbits, viz: that, while descending currents contract (the vessels of the encephalon including its) meninges, ascending currents, from neck to forehead, dilate them; and it is well, also, to bear in mind Löwenfeld's further assertion that cross currents dilate on the side of the anode and contract on that of the cathode, while induced currents in any direction cause *hyperæmia cerebri*. These facts may also be satisfactorily proven by personal experimentation, and the failure to appreciate them is at the foundation of the ill success of so many who have attempted to employ cephalic electrization for therapeutic purposes and discarded it. It has not, in these instances, been the electric current which has been at fault, but the operator who has misdirected it. It is as valuable a servant, when skillfully used, as the surgeon's knife, and we should not condemn it because, in unskillful hands, it may prove equally unsafe aund unsatistactory.

In the present note we content ourselves with a few clinical confirmations of the value of the constant descending current in conditions of the brain associated, primarily or secondarily, with hyperæmia, reserving for another time illustrations of its value in other cerebral states and in certain abnormal conditions of the spinal cord.

Althaus, *vide* "*Brain*," April, 1881, has employed this agent successfully in resolving morbid depositions within the brain, and we have seen hemiplegia, dysphagia and aphasia from lesions of the brain and pons, disappear under its use, and the conviction has forced itself upon us from the more satisfactory results since

its regular employment in our treatment of our epilepsias, con-
joined with internal therapy, that it is an auxilliary in this affec-
tion which ought not to be despised.   True, these cases recover
under treatment without galvanism, but if the majority of our
cases under the combined treatment stay well, whereas formerly
the most of them, perhaps three-fifths, relapsed, it is not unrea-
sonable to have acquired a little faith in its aid.

Althaus (*vide supra*) has successfully treated diabetes insipidus
by galvanizing the medulla; and melancholia, by applying the
current to the occipital lobes; and has caused auditory delusion
to disappear by applying the current to Ferrier's auditory cen-
ters in the superior tempero-sphenoidal convolutions.

We have seen similar results follow the use of the galvanic
current applied to the head and spine, though always from using
a descending current except in tinnitus aurium and other audi-
tory hallucinations.   Bright's and Addison's diseases, which, in
all probability, are intimately associated with renal ganglia dis-
ease in their origin, are greatly benefited by spinal electrizations,
and the former has disappeared under its use, if albumen and
tube casts are to be taken as indubitable evidence of its existence.
Diabetes mellitus, associated with profound melancholia and
sexual apathy (loss of sexual desire without spermatorrhœa for
six months), we have seen cured by it, conjoined with codia,
cannabis indica and neurotic tonics and reconstructives.   The
miracles of medicine already wrought and still capable of being
performed by the aid of galvanism wisely employed as auxilliary
to a judiciously prescribed internal therapy, can not yet be
exactly estimated, but if we judge even from the known curative
verifications of the medicinal power of this agent, our prophetic
record must be a liberal and exalted one.   It will avoid lengthen-
ing this paper, which is intended to be but a brief note on one
part of this interesting subject, if we refer the reader to Dr.
Althaus' two interesting papers, in Nos. XII. and XIII. of
"BRAIN," "*On Some Points in the Diognosis and Treatment of
Brain Disease.*"

The cases of cerebral trouble which we now detail may serve
to illustrate the one aspect of our subject, which we started out
to show:

N. J. W—— is a young unmarried man, of diffident mien, florid complexion ; moderately good flesh ; sleepless ; pulse full and 84 per minute. He is troubled with morbid fears of various kinds, timid, forgetful, and unable to attend to business. His appetite is ravenous, and he is suspicious of the good intentions of his best friends, irritable and cross with them. He is of a sanguine, nervous temperament ; some of his family have died of consumption; a sister is excessively nervous and his father died of cancer. Insanity with him is an impending possibility. Cephalic electrization through February and March (1879) and some general treatment in April restored him. He now (1882) attends regularly to business, having only occasional slight recurrences of the head symptoms, which a few days' treatment promptly dissipates.

A young clerk, F. G. W., æt. twenty-three, of full habit, red in the face, with bounding accelerated pulse and constipated ; complains of a severe pressure in the head. Filling a position beneath his aspirations and esteemed by him a menial one, he has become sleepless and melancholy, brooding over what he considers the tyranny of his employer, and lamenting his inexorable adverse fate; he proposes to end his troubles by jumping off the river bridge. A consciousness, however, that something is wrong with his head, leads him to consult his physician, the distinguished Prof. H , who refers him to me. Coming directly to our office, and receiving a five minutes' electrization, he feels more comfortable, and for the present gives up his purpose of suicide. Given a drachm dose of bromide of potassium in a glass of water and retained in the office half an hour, he is then allowed to go home, with another drachm dose combined with half as much chloral, to be taken as he retires. In the morning he takes a citrate of magnesia and mercurial cathartic, and comes to the office for another seance, which, repeated morning and evening for a fortnight, with bromide and chloral for a few nights, to prolong the tranquilizing effect of the electricity, and later, if he should awaken between midnight and morning, an uncombined dose of chloral, to sufficiently prolong his sleep, and this patient's cure is practically complete. An injunction to take a dose of the bromide mixture at night when inclined to be

sleepless, or during the day, if head feels full, and a laxative pill for use when bowels are not free, are all of the precautionary measures prescribed. The patient has had no return of former symptoms at this time (January 1st, 1883).

Mrs. G., æt. thirty-three, married, has borne one child ; has intra-cranial, vascular tension, auditory and visual hallucinations, highly vascular sclerotics and protruding eyeballs. One of the corneæ is scarred from former ulceration. Has had iritis and been under the care of different oculists for inflammatory and exudative conditions of the cornea and anterior chambers of the eye, and it has been pronounced amaurotic and glaucomatous. At the time she came under my care, March 13, 1881, she could neither see objects in her room, or discern light from darkness, though the pupils were dilated with atropine. Her homœopathic oculist informed her that only Providence could save her. An ophthalmoscopic examination revealed no retinal trouble, so that the inference was justifiable that the failure of vision was due to encephalic trouble beyond the ocular fundus (vascular pressure and exudation about the chiasma, the tubercula quadrigemina and augular gyri probably.) The latter condition being especially inferrable from the flashes of light which she has sometimes seen with closed eyes, and the visions of angels which came to her recently during a period of cerebral excitation. Her heart's action was increased in frequency and force, the pulse being 120 when she came under treatment. She had treatment from an irregular electrician and from most of the pathists of this city, without avail. The electrician employed the interrupted current through the head, a procedure not commendable. The patient had marked insomnia, an impaired appetite and sluggish bowels.

Under gelsemium and the bromides and proto-iodide of mercury, with daily cephalic electrization, eight to twelve elements of a constant current battery—descending current—she so greatly improved in the course of a fortnight that she could distinguish all objects in her room, the lineaments of her physician's and husband's faces, the color of her friends' hair and eyes, etc., in short, to see anything but fine print. Her appetite and general condition every way improved, the sclerotics became normally free from blood, and the sanguineous effusion in the anterior

chamber began rapidly to disappear. Our visits became less frequent after this—every fourth or fifth day. A minimum dose of hyoscyamia had a very unsatisfactory effect, causing much cerebral excitement, and some kalium iodidum likewise discovered in her an idiocyncrasy, causing, in ten grain doses, an intense diarrhœa. These abortive effects greatly prejudiced the patient against our treatment, notwithstanding we had come in as a *dernier ressort* and greatly benefited her, and during our absence at Richmond, she returned to the infinitesimals.

This patient had formerly suffered from malarial congestions, and some years ago fell down unconscious in an apoplectic fit, from which, in a few weeks, she slowly recovered.

The therapeutic lesson of this case confirms what I have so often before clinically proven, that it has become a fixed article of therapeutic faith with me, that for hyperæmic cerebral states, passive effusions and intra-cranial exudations, constant galvanism is the remedy *par excellence*. The current seemingly acts equally well when applied from above downwards, following the direction of the normal nerve influence, from one hemisphere of the cortex down through the basal ganglia and out at the opposite side of the medulla, as when the electrodes are placed so as to impress the cervical sympathetic, namely, behind carotid at the ramus and angle of the jaw, and at the back of the neck above the seventh cervical vertebra.

Dr. Fdward C. Mann, of New York, in Vol. VII., part 2, of the *London Journal of Physiological Medicine and Mental Pathology*, reports an interesting case of blindness and deafness, resulting from cerebro-spinal meningitis, successfully treated by him with a constant current, in which he details an experience with the electricity quite in accord with our own. We have never, however, cured a case of post meningitic blindness or deafness from this agent, though we have employed it with a view (and we think successfully) of averting this and other horrible sequelæ of this formidable affection.

The following case, however, is much like the preceding. The details of the case appear more at length in a late number of the *Louisville Medical News*. The case was also verbally reported by us along with a number of others, to the Southern Illinois

Medical Society, which lately met at Anna, Ills.   The patient is
quite well-known in that section of the country :

Rev. L. is a Presbyterian divine residing in Illinois, of intensely
studious habits, preparing his weekly sermons with much research
and solicitude.   The time habitually devoted to this labor is from
the middle of the week until the following Sabbath ; his hours of
most intense labor being the night time, rarely terminating before
midnight on Saturdays, and later, on other nights.

His congregation is influential, critical and appreciative of his
work, which he realizes, and while he has labored with solicitude
to fill their expectations of him, and he had none of those feelings
of depression which come from a consciousness of unappreciated
effort, and is not melancholic.   He has, however, realized of late
the failure of his mental powers for prolonged studious effort, and
has become conscious that he must get relief or abandon his
calling.

His symptoms, when he first came under observation, were pro-
trusion of the right eye and inability to distinguish light from
darkness with it ; cephalagia with inability to labor mentally
without intensifying it ; full pulse, 84 per minute, and increased
temperature, 99.5 F. on side of blindness ; sluggish bowels ; an
ill-at-ease sort of feeling in the daytime, and incapacity for suffi-
ciently prolonged, dreamless and refreshing sleep, to daily recuper-
ate him.   He had no catarrh, and there were objective noises in
his left ear.   Otoscopic and ophthalmoscopic examination gave
negative results.   Æsthesiometric examination gave abnormal
and lessened tactile sensibility in the terminal branches of the tri-
facial.   Giddy sensations were complained of, and his appetite
was somewhat impaired.   The renal, hepatic, enteric and cardiac
functions, save the ganglionic excitation in the latter, were not
appreciably abnormal.

The condition of this patient was one of partial paralysis of the
vaso-constrictor nervous system, due probably to malarial influen-
ces as the pre-determining cause, and to psychical overstrain as
the immediate exciting cause.   I regard the cerebral pathological
condition as one of psychically induced cerebral hyperæmia with
meningeal hyperæsthesia and cortex irritability.

The treatment consisted mainly in cerebral galvanization with
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the constant descending current daily, of varying strength, enforced brain rest, and chemical restraint imposed by the sodium and potassic bromides in afterpart of day and night, together with all rational efforts to restore trophic and waste cerebral equilibration.　The following further history of this case is given by the patient himself:

" I came into Southern Illinois in the spring of 1876.　After being here about a month or two, I took chills and fever.　I was troubled with them for about one year.　After getting clear of them I began to be troubled with what my physician here called nervous headache.　As time passed this grew more troublesome until I had it half or more, probably of my time.　In September, 1881, I went north to spend a few days, and while there had severe pains in my head, and was under the necessity of remaining in a dark room for about forty-eight hours.　During that time I lost the sight of my right eye entirely.　Came back home and staid till last November, when my left eye became somewhat affected, when I placed my case in your hands, or under your treatment.　My sight was perfectly restored before I left the city, and since I have had no trouble whatever, so far as they are concerned.　I have been able to work ever since I returned home.　Have done harder work and more of it than for three or four years before.　My head does not trouble me much now.　I think I have had headache but once during the last month.　I eat well, sleep well, I feel well generally, but I am exceedingly nervous."

The patient has lost thirty seven pounds in weight, and complains that he can hardly hold a paper still enough to read it. He will require further treatment for the general nervous symptoms, but the cerebral hyperæmia, meningeal hyperæsthesia and cortex irritability were subdued by the treatment and the concomitant blindness due to the cerebral condition, disappeared simultaneously.

In our view, while the effect of cephalic electrization is to produce diminished circulation within the brain, this effect is often undoubtedly contributed to by a concomitant or precedent tranquilization of the cerebral cells, whose state of excitation induces hyperæmia.　The effect on the brain and its meninges may be primary, on the circulation secondary to, and as a consequence

of, the tranquilization of the excited cell movements, in some cases. *An essential property of the constant descending galvanic current in induced cerebral hyperæmia is that of a tranquilizer of irritable nerve tissue,* secondarily contributing to the contraction of over-distended vessels. It acts on the irritable brain like bromides, hyoscyamin and chloral, vasomotor results being secondarily induced when there is over vascular distension as well as primarily accomplished.

Certain effects of cephalic electrization are too immediate to be the result solely of the circulatory changes made by it. For example: the prompt relief of migrain and other hyperæsthetic neuroses of the meninges, as well as in all forms of anæmic and congestive cephalalgias; though it is undoubtedly more effective in the latter.

It is a well-known fact, in regard to certain hypnotics, that they first accelerate and augment in force the cerebral circulation, even while the obtunding of consciousness and the gradual quiescence of the brain is being accomplished, so that to attribute their sleep-inducing power to their influence over the vasomotor system is not logical. They induce sleep under varying states of the circulation, as in opium, alcohol, chloral and bromide slumber, the state of the circulation being different in all. We may fall into error if we attribute the effects of electricity solely to its vasomotor influence.

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SECONDARY PUERPERAL HÆMORRHAGE. By PAUL F. MUNDÉ, M.D., Professor of Gynæcology and Obstetrics at the New York Policlinic; Professor of Gynæcology at Dartmouth College; Gynæcologist to Mt. Sinai Hospital; Visiting Surgeon to Maternity Hospital, New York.

While the occurrence of more or less alarming uterine hæmorrhage immediately after or during the first twelve hours following delivery is by no means uncommon, and while its causation, prevention, and treatment are thoroughly discussed in all the text-books on obstetrics, and in the current medical press, the

subject of metrorrhagia at a later period of the puerperal state, so-called " secondary hæmorrhage," has received comparatively little attention. The majority of obstetric treatises scarcely refer to the possibility that alarming uterine hæmorrhage may occur as late as several weeks after confinement, and only the standard works of Barker, Winckel, Playfair, Spiegelberg and Barnes devote a fair amount of space to this accident. And even these authors, while alluding to individual experience of their own, all refer to the wellnigh exhaustive memoirs of McClintock,* of Dublin, published in 1851, and of Bassett,† of Birmingham, in 1872. Barker and Playfair both remark that this variety of uterine hæmorrhage has not received sufficient notice in the text-books, although, as the latter writer says, it " often gives rise to serious and even fatal results, and is always somwhat obscure in its etiology, and difficult to treat."

As for the medical press, while " post-partum hæmorrhage," that is, the primary and immediate variety, seems a favorite theme, and has even excited the most animated, and at times personal discussions in our obstetrical societies, the, if more rare, not less serious secondary variety, is scarcely ever recorded. It was this very fact, no doubt, which some two years ago induced the learned professor of obstetrics at Indianapolis, Dr. Theophilus Parvin, to write an elaborate essay on this subject, which he read before the American Gynæcological Society at its meeting in Cincinnati in September, 1880, and which is published in Vol. V of the Transactions of that Society. Inasmuch as this admirable series is probably mostly read by specialists, and naturally not as familiar to the general profession as it should be, and the society wishes it were, Dr. Parvin's paper has possibly escaped the notice of many of my readers, as, indeed, I had entirely forgotten its existence (not having been at the meeting where it was read), until after this article was written, when my attention was called to it by a friend. These circumstances, and the comparative rarity and gravity of the accident, are, in my opinion, sufficient reason for the report of the following case, which pre-

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* Secondary hæmorrhage after parturition.—*Dublin Jour. Med. Sci.*, May, 1851.

† *Irit. Med Jour.*, 1872.

sents, in addition, certain peculiarities of special interest, not referred to by Dr. Parvin.

On August 2, 1882, about noon, I was sent for in great haste by Dr. S. Kohn, to see a lady who was said to be in great danger from uterine hæmorrhage.   On arriving at the house, I learned from the doctor the following history :   Mrs. C. G., twenty-five years of age, mother of three children, had always been in robust health.   Was taken in labor on July 16 with her fourth child. Labor progressed very slowly, in spite of severe pains, until the head almost rested upon the perineum, completely filling the pelvic cavity.   As no advance was made, and labor had already lasted twenty-one hours, the forceps were applied, but slipped off twice.   An hour later, the forceps having again been attempted with the same result, the cranium was opened with scissors, and the forceps were again applied, and again refused to hold.   The cephalotribe was then employed, and the head delivered ; the remainder of the child was easily extracted.   The cause of the difficulty proved to be hydrocephalus.   Hæmorrhage was quite profuse, but soon ceased.   The placenta was adherent to the right side of the fundus, and required complete separation by the hand. Care was taken to avoid leaving any fragments behind.   Two fluid drachms of ergot were administered by the mouth, and all hæmorrhage ceased.   On examination, it was found that the anterior lip of the cervix was quite badly torn.

The patient felt well the next day, and appeared to be doing finely for the next six days, although the temperature and pulse kept at 101.5° to 102° and 120 respectively.   The lochia were fetid from the third day on ; and the uterine injections washed away numerous small shreds and coagula, until the lochia lost their offensive odor.

On July 28, however, the eleventh day, the lochia again became offensive, but the odor was different from that noticed at first ; and the discharge was more scanty, serous, with admixture of a reddish-black fluid, like that discharged from under a slough in any part of the body.   The temperature now reached 103° for one hour, and then fell to 102°, remaining at 101° to 102° night and morning for several days.   On the thirteenth day, July 30, the temperature was 100° in the morning; 101° in the evening.   The patient felt quite

well, sat up in bed a little every day, and read the paper. Appetite for solid food absent, but milk, soup, and wine taken in fair quantities. The bladder failed to do its duty, and the catheter was required twice daily. Probably it had been bruised during the long labor and delivery. On the sixteenth day, August 2, at five o'clock in the morning, a profuse hæmorrhage began, which, when the doctor saw the patient at 9:30 o'clock, had almost exsanguinated the patient. Her friends had attached little importance to the flow at that late day, and did not send for him until her weak condition had begun to alarm them. He found her lying in a pool of blood, and immediate interference imperative. The bleeding was arrested for a moment by a hot water intra-uteride injection, but soon recommenced; was again checked by hot injection and tamponade of the vagina, and I was sent for. When I arrived, I found in attendance Drs. S. Kohn, C. A. von Ramdohr, and J. H. Hillyer. The physician who had confined the lady, Dr. Julius Bopp, was not present.

I found the patient with low head, perfectly pallid; face, hands and feet cold and clammy; pulse 120 and very faint; consciousness unimpaired. She merely complained of feeling very weak. On palpating the abdomen, I felt the fundus on a level with the umbilicus, irregular in outline, the right horn extending several inches above the navel. Moderate tenderness. The tampons protruded from the vulva, and were matted together by a moderate amount of bright-red coagulated blood. There was a somewhat offensive odor about the vulva. In spite of the weak condition of the patient, it seemed advisable to remove the tampons and endeavor to arrest the hæmorrhage permanently, which evidently had ceased but temporarily. So long as the uterus was distended by coagula, as at present, no permanent cessation of the bleeding could be expected, and the decomposition of the coagula would but add to the danger by producing septic infection. After preparing fresh carbolized tampons, procuring a few ounces of pure tr. iodine, and a fountain syringe filled with very hot carbolized water, I rapidly removed the tampons, and at once passed my hand into the dilated vagina, and through it into the distended uterine cavity. The latter I found filled with soft coagula, which I speedily removed to the amount of several handfuls. They

were exceedingly offensive, dark-colored, and largely mixed with shreds of decidua. After clearing out the uterus, I found its internal surface very soft, pulpy, and the mucous membrane apparently very much thickened. Near the fundus,' the finger easily entered the tissue, and the sensation given was exactly as though the opposing surfaces of endometrium had become adherent, and were separated by my finger. I had felt such a condition but once before, in a case of septic endometritis seen in consultation last spring, which terminated fatally. The endometrium was quite smooth, and there was no evidence of retention of placental fragments. Each horn of the uterus was separated from the main cavity by a circular band, the right horn being the larger. After rapidly cleaning out the uterine cavity, wherein caution was necessary in order to avoid injuring, perhaps perforating, the pulpy wall of the organ, I introduced a long metal tube and washed it out with carbolized water from a fountain syringe, the water being as hot as my hand could bear. The patient's sensibilities were so low in her exhausted condition, that she did not complain of the heat. I then introduced a large cylindrical speculum, through it the tip of a long cervical syringe, and injected half an ounce of pure simple tr. iodine into the uterine cavity, using some force in order to ensure the thorough distribution of the iodine. As it flowed into the speculum I mopped it up with cotton, and then packed the vagina with cotton tampons joined by a cord, and withdrew the speculum. Had the patient not been so weak, I should have applied the iodine and the tampons through Sims' speculum, and perhaps have then tamponed the cavity of the uterus itself. But as it was, the tampons were applied merely as a safeguard against further hæmorrhage in case the iodine failed to check it, and I ordered them to be removed in six hours. The patient's extreme weakness made it imperative that she should under no circumstances lose another drop of blood.

The injection of iodine gave no pain whatever, nor was it followed by shock. But the pulse now became so faint that six hypodermics of brandy were given, and ten drops of aromatic spirits of ammonia, five drops of spirits of camphor, and a teaspoonful of brandy, were ordered in ice-water every half-hour. As an additional safeguard against hæmorrhage, a hypodermic

syringeful of Squibb's fll. extr. of ergot was injected into the subcutaneous cellular tissue of the abdomen, and an ice-bag placed over the uterus. I was so afraid of a return of the hæmorrhage, that I preferred to risk the possible depressing effects of the ergot on the patient, even in her weak state, rather than to omit any reasonable precaution against hæmorrhage. A bottle of hot water was also placed at the feet.

I then left the patient, with directions, after removal of the tampons, to inject the uterine cavity very gently with tepid carbolized water, as a preventive against the decomposition of the iodine coagula.

The next morning I received a telegram informing me that the patient had rallied. On visiting her twenty-four hours after the treatment already described, I found her with a circular flush on each cheek, bright eyes; pulse 120 and bounding; temp. in axilla 101.5°. There had been no more hæmorrhage, although the uterus had been washed out several times.

The doctor informed me that soon after my departure on the previous day the patient went into so profound a collapse that he thought she would not rally; she also vomited freely. After a few hours, however, she recovered, and he expressed himself as hopeful of her recovery. I told him that I could but repeat my conviction expressed the previous day, that if she rallied from the hæmorrhage I did not fear its return, but that I very much apprehended the issue of the septic endometritis from which the patient seemed to be suffering. In this opinion I was confirmed by the hectic flush and the peculiar sweetish odor about the patient. I directed tepid injections of a dilute solution (1-6 per cent.) of permanganate of potash into the uterus every three hours, more or less, according to the offensiveness of the discharge; further, salicylate of soda in capsules, ten grains every two hours, if borne by the stomach, in case the temperature should rise above 102°. Otherwise. stimulants *ad lib*. My prognosis was unfavorable.

As I was attending a case of confinement, I begged to be excused from further charge of the case, merely signifying my willingness to be of assistance at any future time if wanted. The remainder of the history I owe to the kindness of the attending physician, Dr. Kohn.

Beginning immediately after the permanent arrest of the hæm-orrhage, every means was employed to replace the blood lost, and enemata of meat extract, brandy, and warm salt water were given hourly, as well as frequent hypodermics of brandy.   The stomach could retain nothing, even iced champagne being rejected.   At 3:15 P. M., temp. 101°; at 10:30 P. M., 105° ; pulse 132.   Re-action had now taken place.

Carbolized intra-uterine injections were employed every three hours.

Aug. 4—Temp., 7:30 A. M., 101.3°; 10:30 A. M., 102.3°; 4:30 P. M., 103.4°.

Aug. 5—Intra-uterine injections with sulphate of quinine. Morning -Temp., 101.3°.   Evening—Temp., 102.5°.

Aug. 6—3:30 A. M., 102°; 7:30 A. M., 100.5°; 9 A. M., 100.1°; 12 M., 101.1° ; 8 P. M., 102.1°.   Pulse, 114.

Nourishment and brandy taken in good quantity.   Sensorium clear.   Bowels moved twice after enema.   Since yesterday lochia have changed from their putrid to a more natural odor, and appear merely purulent.

A circumscribed swelling is also noticeable to the left of the umbilicus, which Dr. Bopp believes to be an exudation into the broad ligament.   An ice-bag was applied.   Dr. Kohn thinks this may be an effort of nature to check the disintegrating process going on within the uterus.

Aug. 6—10 P. M.   Patient sleeping quietly after an intra-uterine irrigation and an egg-nogg.

Aug. 8—Temp., 100°; pulse 100 to 110.   Lochia profuse and purulent; swelling in left side disappearing.   General depression and hectic facies have given way to a feeling of comfort and con-tentment.   Uterus syringed several times daily with a solution of sulph. quinine, ℨ i to the quart.

The patient made a very slow recovery, it being fully five weeks after the hæmorrhage, as the doctor informed me, before complete convalescence was established.   Only the most unremitting care and constant irrigation of the uterus with sol. potass. permang., with stimulants and tonics, finally succeeded in saving the patient's life.   The offensive lochia continued for several weeks after the hæmorrhage.

There are several points of interest in this case which I will
review in detail.

1. *The cause of the hæmorrhage* —The conditions which may
produce secondary uterine hæmorrhage are enumerated by Barker
and Playfair as follows: Constitutional: Hemophilia; mental
emotion; functional disease of liver (?); incautious use of stim-
ulants; sudden assumption of the erect position. Local: Irreg-
ular and inefficient contraction of the uterus; clots in the uterine
cavity; portions of retained placenta or membranes; retroflexion
of the uterus; laceration of the vagina or vulva; laceration or
erosion of the cervix; ("inflammatory ulceration of cervix"
Bennett); malignant disease of cervix; pelvic cellulitis; inversion
of the uterus; premature sexual intercourse; loaded rectum.

To these I would add one cause which these two authorities do
not mention, but which Winckel speaks of, and which I have
repatedly seen as the reason for secondary internal hæmorrhage
during the first forty-eight hours after labor, namely, the dis-
tended urinary bladder. Uterine contraction is interfered with
by the enlarged bladder, the uterine ,cavity fills with blood, and
the fundus is found pushed to one side, and even as high as mid-
way between umbilicus and diaphragm. A case is mentioned by
Winckel, in which a similar result was produced by a recently
developed ovarian cyst, which dragged the uterus up and inter-
fered with its contraction. Profuse hæmorrhage occurred on the
third day.

Forcible straining during defecation may also dislodge newly
formed thrombi at the placental site. And four cases are men-
tioned by Winckel in which secondary hæmorrhage occurred
during a chill. It is quite plausible that the form of malarial
infection known as a "congestive chill" may, by the powerful
determination of blood to the internal organs, produce a uterine
hæmorrhage even at a late day after confinement. Indeed, Play-
fair cites Saboia as authority that in Brazil, secondary puerperal
hæmorrhage is a common symptom of malarial poisoning, and can
only be cured by change of air and the free use of quinine.
And Barker, in his well-known paper on "Puerperal Malarial
Fever," * reports five cases in which secondary hæmorrhage

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* *Amer. Jour. Obst.*, April, 1880.

appeared after the twelfth day, apparently as the result of malarial fever; in two cases the hæmorrhage was alarming. Hanks also reports a case of serious secondary hæmorrhage from the same cause.*

General febrile disturbances (exanthemata, typhoid fever, rheumatism, pneumonia, etc.,) occurring during childbed, may, by means of the greater circulatory activity existing at such times, also cause secondary metrorrhagia.

A cause upon which great stress is laid by Winckel is too early getting up; at least sixteen per cent. of the lying-in women under his care lost blood (in small amount, of course) on the ninth day, soon after leaving their beds for the first time. Still another cause, in which I am particularly interested in this instance, is also spoken of by Winckel, and, so far as I can find, by him alone, and that is, diseases of the inner surface of the uterus, chiefly endometritis. This, Winckel says, is one of the rarer causes of secondary hæmorrhage, which may be due either to the congestion of the endometrium, or (especially in the diphtheritic form) to erosion of the already occluded vessels of the placental site, by sloughing, I presume.

When I was asked by the gentleman first attending the present case, what I thought to be the origin of the hæmorrhage, I replied that the patient seemed to me to be unquestionably suffering from septic endometritis, with a decided hyperplasia of the endometrium, a species of fungoid proliferation ; the constant rise of temperature during the week, with the offensive lochia, seemed to speak for this assumption. The bleeding I believed to be due to a superficial sloughing of more or less of the surface of the hyperplastic endometrium. At that time I was not aware that puerperal endometritis is cited as one of the causes of secondary hæmorrhage. I now think it quite possible that a deeper slough, probat the placental site, took place, and that the newly formed thrombi were dislodged. This supposition seems more plausible than that of a universal oozing, since Spiegelberg says that septic endometritis, by its obliteration of the superficial vessels, prevents secondary hæmorrhage. I presume we have all seen the newly

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* Am. Jour. Obst., Jan., 1880.

formed decidua in post-mortems from septic endometritis changed into a pulpy, fibrinous mass.

Of course, this view of mine could have been confirmed only by an autopsy ; but I can positively assert that no fragment of placenta remained in the uterus, that no deep fissure in the uterine wall existed, and that the endometrium was perfectly smooth. If I am correct, we must consider secondary hæmorrhage a possible additional danger to be apprehended from, and guarded against in, puerperal septic endometritis, a disease surely quite serious enough by itself.

2.   *The date of the hæmorrhage after delivery.*—The time at which secondary hæmorrhage is liable to occur varies greatly in accordance with the character of the labor, the care taken of the third stage, the precautions employed during childbed, and accidental circumstances.   As a rule, is may be assumed that the more thoroughly and carefully the contraction of the uterus has been assured after delivery of the placenta, and its relaxation guarded against, for some hours at least, the less likely is early secondary hæmorrhage, that is, within the first forty-eight hours, to occur.   In institutions where stringent rules exist as to the supervision of the uterus after delivery, and the firm contraction of the organ is insisted upon before the attendant leaves the patient, it is a rare thing to find the uterus distended with blood after the first twelve hours have elapsed.   Thus, Winckel cites but three cases out of fifty in which the hæmorrhage occurred during the first three days after delivery.   The same proportion will be found in the practices of those physicians who follow the rules referred to, chief among which are the maintenance of firm contraction of the uterus by gentle friction of the abdomen for at least half an hour after the expulsion of the placenta, and the administration of ergot (generally one drachm of the fl. extr. suffices) immediately after the birth of the child.   If these rules are neglected, and chiefly if friction is not kept up long enough until permanent contraction is assured, in a few hours the uterus again relaxes, blood oozes from the placento-uterine sinuses, and at the next visit the physician finds himself obliged to express a coagulum of greater or less size, if nature's provision, the afterpains, has not forestalled him.   In a recent case which I saw in

consultation for an excessive laceration of the perineum, about forty hours after delivery, I found a full bladder and a uterus distended by a dark, soft coagulum of about the size of a fist.

Between the third and tenth days Winckel found eighteen cases of hæmorrhage, for the most part of moderate degree. This frequency must be partly attributed to the exertion of getting up, since most of the women left their beds on the tenth day. Of the whole fifty cases, in twenty-six the hæmorrhage occurred after the tenth day. This last proportion is unusually large, and I am at a loss to account for it, since Winckel omits to give particulars of these cases. As a rule, hæmorrhage occurring or continuing after the woman leaves her bed is due to retention of some small fragment of placenta (chiefly after abortion), or to deficient involution of the uterus, or occasionally to sloughing of the endometrium. I have already stated that, in my opinion, the hæmorrhage in the present case was due to the last-mentioned cause. Bassett * mentions four cases in which the bleeding was due to retention of portions of the placenta or membranes, and came on the tenth, twelfth, fourteenth, and thirty-second days ; Barker refers to instances as late as the fifth or sixth week after delivery, and Helfer speaks of one during the fourth week. The oozing which is so frequently found as a consequence of subinvolution and deficient contraction of the uterus, especially after abortion, and after normal labors in flabby, atonic, anæmic women, may last for months, and only ceases after general tonic and astriagent local treatment. In these cases the return of the first menstrual epoch is frequently marked by an unusually profuse flow.

Laceration of the cervix during the recent labor exerts an unquestionable influence in prolonging the oozing from the uterus, both by means of interference with involution and through direct hæmorrhage from the rent itself.

3. *The diagnosis of secondary uterine hæmorrhage* need be mentioned only to point out that in the early cases the outlines of the uterus should always be clearly defined, since the hæmorrhage may be wholly internal, and be suspected only by the pallor or collapse of the patient. At a later date, when the uterine cavity is

* *British Med. Jour.*, 1872.

smaller, the discharge of blood from the vagina of course reveals
the nature of the case.   The cause of the hæmorrhage, however,
may not be so easily ascertained, especially in the later cases,
when it may be necessary to dilate the uterine cavity by tents or
rubber tubes in order to make the diagnosis by introduction of
the finger.

4.   *The significance of secondary hæmorrhage* depends partly
upon the amount of blood lost and escaping, and partly on the
origin of the flow.   The sooner the patient is seen and the flow
controlled, of course, the less dangerous the case.   Hæmorrhage
depending on mere temporary atony of the uterus, which can
ordinarly be checked at once by friction, compression, and styp-
tics, is evidently less serious than if due to sloughing of the
placento-uterine thrombi or bursting of an ectatic vein.   While
Spiegelberg, who speaks of having seen one serious case of hæm-
orrhage on the fourth day from simple atony of the uterus, and
a number of other severe hæmorrhages from retention of portions
of the secundines, did not lose a case, Bassett had two deaths out
of thirteen cases, and McClintock collected six fatal cases.   Mme.
La Chapelle mentions a case of death on the eighth day from
internal hæmorrhage and retention of the clot.   Barker relates
an instance of almost fatal hæmorrhage on the second day from
mental emotion, and McClintock one on the twelfth day from
taking a dose of brandy while sitting up for the first time, and
another on the eighth day from mental excitement.   In my case,
there can be no doubt that even a very slight additional hæmor-
rhage would have proved fatal.   The occurrence of serious or
fatal hæmorrhage at a later date than the fourteenth day after
delivery is certainly very rare.   The chief evil consequences
of protracted secondary hæmorrhage, metrorrhagia lochialis, as
Breisky * calls it, is the debilitating effect on the woman, and
subsequent uterine disease of some form or other.

5.   *The means employed to check the hæmorrhage.*—The in-
jection of pure tincture of iodine into the uterine cavity as a
hermostatic after delivery has been recommended by Dupierris
and Lente, and practiced by many others in occasional cases; the

* Breisky; Treatment of Puerperal Hæmorrhage, *Volkmann's Klin. Vorträge,* No. 14, 1871,
p. 108.

excellent effects of the agent in non-puerperal hæmorrhage have been warmly praised by Thomas Addis Emmet, whose example has been followed by many of us. I am not aware that iodine has been used as an injection in secondary hæmorrhage, but there is no reason why its styptic effects should be less pronounced then than immediately after delivery. Besides, it is an excellent disinfectant, which was of importance in the present case. It does not form hard coagula, as does the tr. of perchloride of iron, which coagula are liable to decompose and give rise to septic infection, or by their presence excite fresh hæmorrhage. I might, it is true, have employed the mixture in equal parts of the tr. ferri perchloridi, or persulphatis and glycerine, according to the practice of Dr. H. P. C. Wilson, whereby the formation of coagula does not take place. And had the hæmorrhage returned, I should undoubtedly have employed this formula. As it happened, the iodine first occurred to me, and proved effectual.

The method of injecting the iodine through a cylindrical speculum is to be recommended, as a means of saving the vagina and vulva from the unavoidable contact with the fluid if the latter is simply injected into the uterus under guidance of the finger. In the present case, finding that I could not pass the nozzle of the syringe quite to the fundus through the speculum, I first inserted the syringe, and then passed the speculum over it.

As regards the application of a tampon after labor, I need scarcely say that it should never be done unless the uterus is so contracted and constantly watched that no internal hæmorrhage can take place. In the present instance, doubtless, the tampon which I removed had caused the accumulation of blood in, and the distension of, the uterus; but it had arrested the external hæmorrhage, which was far more severe than the internal bleeding was likely to be. Besides, at so late a period as sixteen days after delivery, the attending physicians were to a great extent justified in not looking for so easy a distensibility of the uterus. I re-applied the tampon temporarily as a possible safeguard against external hæmorrhage until the patient had had time to rally a little, and with the positive understanding that the fundus uteri should be carefully watched until the tampon was removed.

The hypodermic of ergot was administered more for its specific

hermostatic effect, than with any idea of contracting the uterine
muscle, which, in its inflamed, pulpy condition, seemed incapable
of healthy contraction.   In the collapsed condition of the patient,
this agent might possibly have been omitted.   Still, it did no
injury.

It is possible that the hot water injection might have been suf-
ficient to check the bleeding.   I thought, however, that it was
best to take no chances, but to do the work thoroughly.

As a rule, it may be assumed that the same remedies and
measures which are used to check primary uterine hæmorrhage
will be effectual in the secondary variety.   Even when the hæm-
orrhage occurs at a late date after delivery, the agents which act
chiefly by contracting the uterine muscle, as ergot, viscum album,
fl. ext. gossypium, ustilago maidis, etc., will prove useful, as well
as the general styptics, like sulphuric acid, cannabis indica,
matico, etc.   In cases where the hæmorrhage depends on pelvic
congestion, saline laxatives, combined with or followed by ergot
and sulphate of iron, will be serviceable.

In the earlier periods after delivery, the clearing out of clots
from the uterine cavity with the hand, and the excitation of the
organ to contraction by external and internal friction, then, if
still necessary, the intra-uterine injection of styptics, will be
indicated.   At a later date, when the uterus has already under-
gone a certain degree of involution and the cavity is small, the
repeated introduction of astringents into it on cotton cones
slipped off from applicators, and the firm columnar tamponade of
the vagina with flat discs through Sims' speculum, may be re-
quired.   The latter are more usually cases of protracted bloody
lochial discharge, or of constant sanguineous oozing due to sub-
involution.   The eventual closure of a cervical rent will become
imperative after a lapse of at least two months after delivery, if
the flow seems to depend on this injury.   By the introduction of
pure tr. iodine into the uterine cavity on cotton-wrapped applica-
tors, which are immediately withdrawn, about twice a week for
several weeks or months, I have in a number of instances achieved
a complete cessation of the bloody oozing, a return to regular
menstruation if the patient chanced not to be nursing, and a
complete involution of the uterus.   It has not been my intention

to go over the whole ground of secondary puerperal hæmorrage, or to take up separately each of the etiological factors enume-rated in the early part of this paper. For a discussion of these, I will refer to the works of Barker, Winckel, and Playfair, or to the original memoir of McClintock, to which, Playfair says, " We owe almost all our knowledge of this condition ;" and to the paper by Parvin. I merely desire to add another case to the comparatively few on record, and by pointing out some of its peculiar features, perhaps draw out the experience or opinion of the profession.

Before concluding, I wish to say a word as to the prevention of these hæmorrhages, primary and secondary. Assuming a firm, permanent contraction of the uterus after delivery to be a cardinal principle for the prevention of post-partum hæmorrhage, the following brief rules may be laid down for the management of the third stage of labor, and the early puerperal state :

1. Always keep the supporting and compressing hand on the fundus uteri from the moment the head appears at the vulva until the placenta is expelled.

2. Do not hasten the expulsion of the placenta too much, but by steady, gentle friction of the fundus endeavor to obtain its total spontaneous detachment, the occurrence of which can easily be detected by the uniform firm outline of the contracted uterus on palpitation.

3. Always watch the uterus with the hand, using gentle fric-tion for at least an hour, at intervals, before leaving the patient.

4. Always give ergot (one drachm or more of the fl. extr.) by the mouth immediately after the birth of the child. If chloro-form has been given for an operation, or if the labor has been unusually tedious, give the ergot hypodermically, injecting a syringeful of the fl. extract to the depth of one inch, near the umbilicus. It is always advisable to have the syringe filled with ergot, and to see that it is in good working order, before the con-clusion of the labor.

5. Always have ice on hand ; and if the uterus shows a reluctance to remain contracted, rub the fundus gently with a piece of ice, or insert a cone-shaped piece into the cavity. (As a rule, the injection of hot water, while a powerful styptic,

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is less agreeable to the patient at this time, and will scarcely be employed unless actual hæmorrhage occurs.)

6. Always make sure by palpation and compression that the uterus contains no coagula, and if such still form, at once express them.

7. Aid in securing permanent contraction of the uterus by an early application of the child to the breasts.

8. If the labor has been tedious or instrumental, or the uterus contracts badly, or the patient is not to nurse the child, or is constitutionally feeble, it is wise to guard against subinvolution and a long continuance of the bloody lochia, by giving the patient a pill containing one or two grains of Squibb's aqueous extract of ergot, two grains of quinine, and one-third of a grain of extract of nux vomica, three times a day for ten days or two weeks, or longer, beginning on the day after delivery. If the stomach is irritable this combination may be given in rectal suppositories, the quantity of ergot being doubled.

9. Before leaving the patient, an equably tight binder should be applied, and if there be tendency to hæmorrhage, a pad should be placed under the binder over the fundus, to secure its steady compression.

10. Examine the cervix and vagina with the finger immediately after delivery, and if there be a laceration of either, be prepared to check possible future oozing by mild astringent injections, or, if need be, applications through the speculum. (Immediate suture, as recommended by some, appears to me rarely feasible, under the conditions as to light, assistants, hæmorrhage, etc., usually accompanying childbirth).

11. Do not allow a lying-in woman to make rapid motions in bed, strain, sit up suddenly or very long, or to leave her bed before the tenth day.

12. Keep watch of the bladder, particularly during the first twenty-four hours, and assure yourself by palpatation and percussion that it is empty and is not interfering with uterine contraction.

13. Instruct the nurse not to insert the nozzle of the syringe too far, or to use too much force in giving the customary cleansing injections, for fear that the cervix may be bruised.

These rules might be extended, but I am confident that if those here given are carefully observed, primary hæmorrhage will be greatly diminished in frequency, and secondary bleeding, particularly of the atonic and subinvolution type, will rarely be met with. Those cases in which accidental causes are at fault, will, of course, be as little under our control as heretofore.—*Archives of Medicine,* Feb. 1883.

A LECTURE ON THE FREQUENT REPETITION OF DOSES. DELIVERED AT THE BELLEVUE HOSPITAL MEDICAL COLLEGE, by A. A. SMITH, M. D., Professor of Materia Medica and Therapeutics, and of Clinical Medicine.

GENTLEMEN: I propose to direct your attention this morning to the subject referred to at my last lecture, namely, the frequent repetition of doses. This subject is a very important one, and one regarding which it is very difficult to establish any arbitrary rules. In the case of chronic diseases, where it is necessary to continue the treatment for a long time, the plan of administering the medicine in larger doses at intervals of five or six hours is probably the best one which can be adopted. For example, if you were prescribing some preparation of iron in a case of anæmia, it would be unnecessary to give it oftener than three times daily. Again, in certain cases it may be desirable to produce the full effect of the drug at a single dose, as in the administration of a cathartic, or of quinine to reduce temperature.

In other cases, however, it is desired, in administering medicinal remedies, to keep up their continued effect, and the question arises, whether we can accomplish this purpose better by giving them in smaller doses at frequent intervals than by giving them in large doses at much longer intervals, the total amount of the drug in the end being, perhaps, the same in either case. It is a fact with which you are acquainted that certain drugs become absorbed and produce their effect upon the system in a very short time, and they may also be eliminated very rapidly, while others act slowly and are eliminated after a longer interval.

It is not my intention this morning to deliver a scientific lec-

ture; I shall make certain statements based upon clinical facts for which I shall not attempt to give any explanation.

The first drug to which I would call your attention in connection with the subject of the lecture is the chlorate of potash. It may not be unknown to most of you that this drug has at times been administered in sufficiently large doses to produce a dangerous inflammation of the kidneys. Special attention has been called to this fact by Dr. Jacobi, of this city, and also by other authors. This danger can be avoided by administering the drug in small doses frequently repeated. In writing the prescription, a teaspoonful of the solution may be made to represent as much of the drug as you wish to give; or, if it be in a more concentrated form, the patient may add water to it. Grain doses given every half-hour in scarlet fever, diphtheria, tonsillitis, etc., will produce the same results as larger doses, without the danger of the evil effects resulting from the accumulation of the drug in the system, as sometimes happens when it is administered in the ordinary way. Indeed, I believe they will produce better results upon the throat inflammations.

For the treatment of neuralgia, croton chloral has for a long time been given in large doses, as from five to eight grains, repeated every two hours, until fifteen grains are taken. But allow me to suggest what I consider a better mode of administering the drug—that is, to give a grain of it, prepared as you please, either in liquid or pill form, every half hour until the neuralgic symptoms are relieved. A solution of which a teaspoonful represents a grain of the croton chloral may be made, having scarcely any of the bad taste which usually belongs to this medicine when given in large doses. I may here remark that one of the important advantages connected with the frequent repetition of doses is the fact that the medicine may be so largely diluted with water or other vehicle as to be rendered comparatively tasteless, and harmless to the mucous membrane of the stomach.

You will often be called upon to treat very obstinate cases of urticaria, and you will be put to your wits' end to know what to do. The plan ordinarily suggested is to give alkalies, as the bicarbonate of sodium, or magnesium; but, if you will give the patient two grains of the salicylate of sodium every hour or half-

hour, you will usually be enabled to effect a cure even in obstinate cases, except those of a chronic nature.   Two grains of the salicylate of sodium administered in a teaspoonful of water is almost tasteless, and may be given without producing disturbance of digestion.   Urticaria is often caused by the administration of full doses of balsam of copaiba in cases of urethritis, or inflammation of other mucous membranes, and it may seem strange to you when I make the statement that a single drop of the same drug given every half hour will sometimes control urticaria.   I have no explanation to offer, but I make the statement not alone upon the authority of others; I myself have often observed the efficacy of the treatment, although not so frequently as in the treatment by the salicylate of sodium.

Fowler's solution, or the liquor potassii arsenitis, half a drop given every half-hour for six or eight doses, will often relieve the vomiting which occurs after a debauch.   It will also relieve the morning vomiting of drunkards, and is of decided benefit in the sympathetic nausea and vomiting of pregnancy.

Jaborandi has been given in large doses with a view to exciting perspiration in cases of Bright's disease, but the very serious objection has been found to its administration in this manner, that it sometimes has a very depressing effect upon the heart's action, resulting in some cases fatally.   Now, five to ten-minim doses of the fluid extract of jaborandi given every hour or half-hour will produce marked perspiration without causing any unpleasant effects upon the heart.   I sometimes combine with the jaborandi the tincture of digitalis, with a view to counteract any possible evil influence which the former drug may have upon the heart.   So dangerous do I consider large doses of jaborandi that I often hesitate long before administering it, especially in the uræmia of the puerperal state.

You will please remember that the amount of the medicines administered is not so small as you may at first suppose, especially if you take into consideration their strength and the frequency of their repetition.

The next preparation of which I shall speak is a solution of the sulphate of atropine, one one-hundredth of a grain in a goblet of water, a teaspoonful of which shall constitute a dose, amounting

in all to about sixty doses. Now, you will often be called to see cases of supposed croup, but which, in the majority of instances, prove to be cases of false croup of a reflex origin. Ordinarily, you will be able to relieve these patients by giving them a teaspoonful of this preparation every hour. It is possible the remedy acts slightly as a stimulant of the respiratory center; it is also possible that it has some influence upon muscular contraction or relaxation; at all events, clinical experience proves that it is of benefit in these cases. The dose may be repeated every hour or half-hour, according to the severity of the attack. If the child's face begins to flush and show signs of the physiological effects of the drug, the dose can be reduced in frequency. It should be remembered that when thus administered the equivalent of a full dose of the drug will soon be reached. Do not forget in these cases to give an emetic if there is anything in the stomach which may be causing the spasm, or a cathartic if there be reason to suspect intestinal disturbance as the cause.

The bromides are largely used in the treatment of the nervous and febrile disturbances of children, but an objection to them is the fact that the little patients do not take them readily, because of the taste; the bromide of sodium is, perhaps, as little disagreeable as any of the preparations. This objection can be avoided by giving small doses frequently repeated ; for instance, a few grains dissolved in half a tumblerful of water, a teaspoonful representing a half grain, or a grain even, administered every ten or fifteen minutes. When given in this manner, the bromides often prove of great benefit in the nervous disturbances arising from dentition and other causes, and in relieving the fever which, in children, usually attends a slight degree of excitement of any kind. I have seen an elevation of the temperature in children where it could not be traced to any other cause than the excitement incident to their afternoon play. A temperature which might indicate a sickness of considerable gravity in the adult, if it occur in a child may be of comparatively little importance. In such cases the bromides, administered in small doses, say a grain or two at intervals of ten or fifteen minutes, will often prove of great benefit.

I began the use of some of these remedies administered in this

manner on the recommendation of others, and I must say in a somewhat skeptical frame of mind, thinking that the effect which they produced was probably due to the moral influence upon the patient, or that it had no foundation in fact, it being a mere coincidence that the drugs were administered at a time when the patients would have recovered in the absence of any treatment; but, having seen benefit follow their administration repeatedly, I concluded they must have a wider range of usefulness, and began to use them much more frequently.

You will often meet with children of a nervous, excitable frame of mind, who are, perhaps, naturally of a sensitive, nervous temperament, who are disturbed by the slightest noise, and are unable to go to sleep before ten or eleven o'clock at night. In such cases you will find it necessary to give a nervous sedative. An excellent effect will be produced by chamomilla in some one of its forms, as the tincture, administered in minim doses, every fifteen or twenty minutes. It is tonic as well as sedative. It is a better sedative in such cases than the hydrate of chloral, which is liable to affect the digestion. It is harmless when given in larger doses. Put a teaspoonful into a half-tumblerful of water, and let the child drink it freely.

One of the most important remedies which can be administered with great benefit in frequently repeated doses is ipecac. You are aware that a teaspoonful of the syrup of ipecac is likely to produce emesis; but it is also a fact, regarding which I was at first quite skeptical, that a single drop of the wine of ipecac will often arrest obstinate vomiting. It should be repeated every ten or fifteen minutes. When administered in this manner, I have often known it to relieve vomiting from different causes, among which are pregnancy and subacute gastritis. Children often vomit from very slight causes, and are liable to suffer from diarrhœa and vomiting which have no other assignable cause than disurbance of digestion. A single drop of the wine of ipecac, repeated every fifteen or twenty minutes, will often produce the most marked relief, both from the vomiting and from the diarrhœa. Administered in this manner, the drug is not nauseous, and is easily taken.

I now make a statement, upon the authority of Trousseau and

his enthusiastic successor, which may appear to you, as it once did to me, incredible—viz., that one sixtieth of a grain of calomel taken every hour for ten or twelve hours will relieve the headache of syphilis occurring at night. I have administered it in one-fortieth grain doses in this manner and have obtained the results which they claimed for it, but I have not yet tried it in sixtieth-grain doses. The relief was very marked by the second or third night. It is not intended to take the place of iodides which are given in such cases. Doubtless the calomel, when administered in such small doses, is all taken up into the system.

Nursing children often vomit or regurgitate their food; this has been relieved repeatedly in my experience by giving them a teaspoonful of a solution of one grain of calomel to the pint of water every ten or fifteen minutes. In order to dissolve it, the calomel should first be put into an ounce of lime-water, and then into the pint of pure water. One twenty-fourth of a grain of mercury with chalk, administered every fifteen or twenty minutes, is often of great benefit in the vomiting and non-inflammatory diarrhœa of children. Where the diarrhœa is accompanied by mucous passages, indicative of a certain degree of inflammatory action, or enteritis, benefit will be derived from the administration of one teaspoonful of a solution of bichloride of mercury (corrosive sublimate), one grain to the quart, every hour. The dose may seem very small, but it must be remembered that the dose for an adult is only one sixtieth to one thirtieth of a grain, and, when administered in this manner, the full dose for a child is reached within a few hours.

Another extraordinary statement, which at first seemed to me to be fabulous, and may seem so to you, but which, nevertheless, you will find to be based upon clinical facts: Put a grain of tartar emetic into one quart of water; teaspoonful doses of this solution every half-hour will prove effectual for the relief of the wheezing and cough accompanying a slight bronchitis in children.

A single drop of the tincture of nux vomica given every ten minutes will often produce most marked relief in sick headache not of a neurotic origin. It should be given immediately after or soon after meals.

It is well known that cantharides, when given in large doses,

is liable to cause inflammation of the urinary tract; but it has been found that a single drop of the tincture every hour will in many cases relieve vesical catarrh.

You probably have heard that digitalis has been used in cardiac disease. Certainly if you have not heard of it you will, and, if you have already heard of it, you will hear of it again. particularly at the clinics. Ordinarily, it is administered in considerable doses only three or four times a day; but I do not hesitate to say that the frequent repetition of small doses will produce much more benefit than larger doses at longer intervals. A single drop of the tincture of digitalis, given to a patient suffering from symptoms due to organic heart disease when digitalis is indicated, administered at intervals of an hour or half-hour, according to the severity of the symptoms, will often give greater relief than larger doses, and without liability to ill effects.

For the diarrhœa of children, accompanied with slight inflammation, straining, and the passage of jelly-looking matter, but not true dysentery, five drops of castor-oil, given every hour in water with sugar and gum, is an excellent remedy.

A gentleman in this city, of authority in the specialty of venereal diseases, says he has given greater relief in a short time, in cases of orchitis and epididymitis, by the administration of two-minim doses of the tincture of pulsatilla every hour than by any other mode of treatment. I can testify to the great benefit derived from the drug administered in this manner in dysmenorrhœa not of a membranous, obstructive, or neuralgic character.

One of the most distressing symptoms from which many women suffer at the menopause is flatulence, and a sensation of fluttering or palpitation at the pit of the stomach, an effectual remedy against which is the extract of calabar bean in one-fiftieth-grain doses, repeated every half-hour for six or eight doses. It may be repeated in the same way after stopping it for three hours.

In cases of amenorrhœa not dependent upon anæmia, benefit may be derived from minim doses of the fluid extract of ergot administered every half-hour for five or six hours the day before the flow should begin, and again on the day on which it should

occur. Contradictory as it may seem, when administered in the same manner the fluid extract of ergot is of benefit in cases of excessive menstruation.

Aconite is one of the drugs to which you will probably have occasion to resort frequently when you enter upon the active practice of medicine. It has for a long time been used in quite small doses, but not so frequently repeated as it might be with benefit. There are many cases of febrile movement, with dry, hot skin, a full, bounding pulse, the mucous membrane of the throat and nose probably dry—cases in which the febrile movement is not the commencement of one of the continued fevers; the tincture of aconite, one third to one half a minim given every fifteen minutes, will be found of decided benefit. Visiting the patient shortly after the commencement of this treatment, you will often find him in a little perspiration; the medicine may then be administered at longer intervals, every half-hour or longer, according to the indications. The tincture of aconite, administered in a similar manner, is also useful in cases of commencing so-called cold in the head. It is likewise useful in cardiac hypertrophy with palpitation, severe headache, and disturbances of the nervous system due to increased force of the heartbeat.

Two minims of the tincture of hamamelis every half-hour will often control hæmorrhages. I was at first inclined to look upon this statement with a great deal of distrust, but I have since tried it in cases of hæmorrhage from the nose, from the uterus, and in the hæmorrhage from hæmorrhoids, and have found it of great benefit.

The tincture of belladonna in minim doses, given every half-hour, is a good remedy in cases of nasal catarrh, and bronchitis accompanied by free secretion. You should cease to give the drug for a while after eight or ten doses have been administered, as it is less quickly eliminated from the system than the other medicines of which we have already spoken. In cases of pulmonary œdema with failure of heart power, belladonna thus administered is of benefit in retarding the exudation of serum, and in overcoming the failure of heart power.

Two grains of the chloride of ammonium, combined with ten

or fifteen minims of the tincture of cubebs, given every half-hour, oftentimes controls acute pharyngitis and superficial inflammations of the other tissues about the throat. For inflammation of the throat dependent upon a gouty diathesis, add to this mixture ten minims of the ammoniated tincture of guaiac, and administer every hour.

In the headache of migraine, one grain of the citrate of caffeine given every half-hour will often produce most marked relief.

In neuralgias about the face or head, three-minim doses of the tincture of gelseminum every half-hour will often act almost miraculously and leave no ill effects.

For certain kinds of headaches (especially those which are periodical and not of malarial origin), fifteen-minim doses of fluid extract of guarana given every fifteen minutes will very frequently relieve. If it does not relieve in four doses, increase the dose to thirty minims.—*New York Medical Journal.*

CLINICAL LECTURE*. By DAVID W. CHEEVER, M. D., Professor of Surgery, Harvard University.

I. CELLULAR ABSCESS.

Gentlemen :—The first case which I bring before you to-day is that of this little girl, who came here a week ago with a hard bunch upon her left wrist. This bunch has now softened. It gives rise to great apparent deformity and protrusion of the ulna, which appearance, however, is deceptive. The wrist-joint moves freely in all directions, without pain. There is a sac containing pus, which I proceed to incise. If the pus is due to caries, the disease at all events does not affect the joint, and it is doubtless merely an inflammation of the cellular tissue.

II. PUNCTURED WOUND OF HAND; LIGATURE OF THE BRACHIAL ARTERY.

This little boy, about six years of age, nearly three weeks ago drove a penknife into his hand, in the neighborhood of the

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* Specially reported for the Boston Medical and Surgical Journal.

first carpo-metacarpal articulation.   The immediate hæmorrhage
was slight.   One week after the injury, however, profuse secon-
dary hæmorrhage occurred.   The physicians in attendance pro-
longed the original incision from the *tabatiere* toward the seat of
the radial artery in the wrist, and made an attempt to secure the
bleeding vessel, but without success.   A firm compress was then
applied to the hand, and the boy was sent from his home, two
hundred miles distant, to Boston, where he arrived exhausted and
pale from the amount of blood that had been lost.   On taking off
the twist from the hand I found a foul suppurating cavity at the
site of the incision ; also a superficial slough on the ulnar side of
the hand, due to pressure of the bandage.   No blood appeared
from the vessel, but there was reason, in view of the bad condi-
tion of the parts, to suppose that hæmorrhage would recur.   I
I therefore ligatured the brachial artery.   The operation was
performed under the spray, and Lister dressings were applied.
This was eleven days ago.   While there has not been absolutely
first intention, the wound has practically healed, as you see, the
granulations having come up to the level of the skin.   The liga-
ture, which was of catgut, never came away, and there is reason
to believe that it has been absorbed.   There is no further danger,
now, of secondary hæmorrhage, and the child can go to his home
in a few days.

There are two points worthy of attention in this case.   First,
the safety of tying the brachial, so far as concerns danger of
mortification of the hand, and its advantages as serving to secure
the interosseous arteries.   By applying the ligature to this ves-
sel, we also avoid the neighborhood of the sloughing tissues about
the wound.   Secondly, the prompt establishment of the collateral
circulation.   On the eighth day after the operation I detected pul-
sation in the ulnar artery, and on the ninth it was observed in the
radial.   It is now perfectly restored in both.   In this case the
nails have retained their bright pink color throughout, and the
hand has been warm.

III. ULCER OF THE UPPER LIP.

This man as you will observe, has upon his upper lip an ulcer,
with ragged, hard edges.   It has been there for six or seven

months.   He has also had for the past three months venereal
sores upon his privates, which have not healed yet.   These sores,
however, seem to be antedated by that upon the lip.   The question in
this case is whether the man has a primary specific sore upon the
lip, or whether the ulcer is a degenerating epithelial growth.
The patient himself ascribes the sore to irritation from a pipe,
aggravated by neglect.   I can detect no enlarged glands in the
neck, and there appears to be no soreness on either side.

It is important to decide on the nature of this sore within a few
weeks for the sake of the treatment.   The man says he has taken
no medicine.   We will therefore put him at once upon a course of
mercurials, and follow it up vigorously for three or four weeks,
either alone or in connection with the iodide.   If by that time
the sore has not begun to heal, it should be excised.

IV. ACUTE SYNOVITIS OF THE WRIST.

This lad is in the employ of a tailor.   He tells me that he is not
called upon to do heavy lifting or other work which would be like-
ly to strain his wrist.   He had previously been in good health,
when suddenly, six days ago, he was taken with pain in the wrist,
without having had any injury.   Stiffness, swelling, and deform-
ity came on at once, preventing the use of the hand.   The hand
appears pushed over to the radial side.   The swelling is confined
to the ulner side, and there is great tenderness through the ulnar
articulation.   He tells me that this is the only point affected, and
that he never has had rheumatism.   The localization of the
trouble makes it look like acute synovitis, which, in the absence
of any strain or injury, may be of rheumatic origin.   As to the
treatment, we will begin with the theory of rheumatism.   The
hand should be placed on a splint; we will give him colchicum
internally, and locally lotions of laudanum and camphor, to be
followed later by iodine.   If the disease is rheumatism it will
probably be relieved by this treatment.   If synovitis it will as-
sume an indolent type, and continue a long time.

V.   COMPLETE CONGENITAL EXTROVERSION OF THE BLADDER.

While the next patient is being etherized I will say a few
words above the case, and will then demonstrate the pathological

condition, and afterwards perform the operation in your presence. It is a girl, six years of age. She presents a defect of fœtal development. The anterior abdominal walls have never completely closed along the median line of the body. There is no umbilicus. The recti muscles separate at a point above where the umbilicus should be, and spread out at an angle, until they become attached to the pubes at quite a distance one from the other. The pelvic bones themselves are separated by a wide interval. The anterior wall of the bladder is absent, and the posterior surface of the mucous membrane is presented to view with the ureters discharging upon it. The interior of the bladder is thus exposed to the air. When the patient is at rest the exposed surface is comparatively flat, but when she coughs, vomits, or strains, it rises up and is pushed forward, in shape and size like a billiard ball; it then bleeds readily, and, as you can imagine, is much irritated by the clothing. There is no urethra, clitoris, or nymphæ. The labia majora lie to the sides by the separated pubic arch. There is a rudimentary vagina, which, as has been noted in other similar cases, lies transversely. The probe enters the vagina an inch and a quarter, and sweeps on either side into a pouch, which is the analogue of the Douglas cul-de-sac in the normal female. The finger introduced into the rectum discovers a small ovoid body, which is probably the rudimentary uterus. The rectum itself appears to be normal.

This is, then, a case of complete exstrophy of the bladder, a disease rare in itself, and especially uncommon in this sex. Of forty recorded cases only seven occurred in females. The inconveniences of the condition are obvious. The child is kept always wet by the trickling urine; excoriation of the skin follows. The tumor is exposed to a constant friction. The mouths of the ureters being constantly irritated, may become blocked by a phosphatic deposit, which is a source of danger. Yet the condition is not inconsistent with life. This child is likely to grow up. Instances have been recorded in which persons thus afflicted have reached the age of seventy or eighty years.

From separation of the recti, and general weakening of the abdominal walls, we find that this deformity often gives rise in males to double inguinal hernia. In this child the rings are

elongated, narrow slits, against which the intestine can be felt on
cough, but into which it does not enter. The child is, therefore,
thus far free from hernia; moreover, her digestion and other
unctions are good, and she may be considered healthy.

Now, on uncovering the parts, you will see that at a point a
little below where the umbilicus should be, there is a crescentic
line, where the transversalis fascia ends. Below this the tissues
are soft, consisting only of the skin and peritonæum over the in-
testine. Below this is the convex surface of the tumor, present-
ing a groove with two lateral lobes, and in shape looking not
unlike the conventionalized " heart " depicted on playing cards.
This is the trigone, and on the edge are the two ureters, which
admit, as you see, a fine probe, and are constantly oozing with
urine. You see the rudimentary labia, and the absence of the
nymphæ. This transverse slit, looking like the meatus, is in
reality the ostium vaginæ. Below, the perinæum and raphé are
normal. The excoriations about the anus, looking like condylo-
mata, are due simply to the irritation of the urine. The fullness
which you see over the separated pubic bones is due chiefly to
fat, and in the male often contains a double inguinal hernia.
But here, as I have said, the ring is empty. My finger and
thumb are on the spines of the pubes, which by measure are
nearly three inches apart. Above the bladder the angle formed
by the receding recti can be readily seen. The existence of the
urachus is denied in these cases. The umbilical cord is attached
about at the upper edge of the bladder, and here the umbilical
vessels terminate. The deformity is due in these cases to a fail-
ure of the anterior layer of the allantois to close. The smallest
degree of the same abnormality is seen in the condition known as
epispadias. A few years ago there was a man who earned his
living by going about the country and exhibiting his extroverted
bladder before the various medical classes.

The treatment of this deformity may be mechanical or opera-
tive. In the former case a urinal is arranged with a metal cup
communicating with a reservoir hanging along the thigh.
This is hard to adjust and keep in place, and would be especially
so in a child of this age. Operative measures may be divided

into two classes, radical and plastic. The former attempts to direct the ureters into the rectum, thus making the lower pouch of the rectum into a bladder, which is to be controlled by the sphincter ani, and which will expell the urine as is necessary, either with or without the fæces. This has often been attempted, and several operations for this purpose have been described. All that I have seen, with one exception, have been disastrous. The patient has usually died either from cellulitis or peritonitis. In those that have survived the result has not been successful. The difficulty is that the peritoneum is displaced like all the other viscera, and one cannot tell how low it comes down. Normally it should go no lower than the line of the trigone. In two cases operated upon in London the peritoneum was perforated, and there was intra-peritoneal extravasation of urine. Another difficulty is that even if the operation is primarily successful the ureters may become blocked up by a phosphatic deposit. To perform this operation it is necessary to pass a fine probe into the ureter; the finger is introduced into the rectum. Then two needles are passed from the rectum, and the lower half inch of the ureter is held in the loop of thread. This is then tightened, and the ureter sloughs through into the rectum by an elongated opening.

T. Holmes' method is to slough the whole back wall of the vesical trigone into the rectum by means of a clamp, thus getting a large fistulous opening.

These operations are all open to the objections of being dangerous, and it is uncertain whether the rectum will tolerate the phosphatic deposits, and whether the sphincter will hold well.

The second class of operations are the plastic ones, where the object is to cover in the deformity by flaps of skin. We cannot hope to make a bladder which will hold water, but we cover it with skin in the expectation that the cicatrix will hold back the bladder, and will leave only an exposed point at the base where the ureters will discharge, and to which a urinal can be more accurately fitted.

T. Holmes' mode of operating is to take one square flap from the groin, and reflect it over the bladder, raw side uppermost. A second flap is cut obliquely from the other groin and labium

or scrotum, and turned or slid over the first, raw surface downwards. A subsequent operation is required to unite the upper edges of these flaps in the wall of the abdomen, above the bladder.

John Wood's operation consists in raising an apron of skin from above the bladder, and turning it down so that the raw surface comes uppermost. Over this are brought two smaller lateral flaps with their raw surfaces downwards; these are joined along the median line, and all are stiched into the margins of the sound skin around the bladder.

Bigelow has grafted the skin directly upon the bladder by dissecting off the mucous membrane above the trigone, raising two flaps at the side, and applying them with the raw surface downward to adhere directly to the bladder, thus occluding the upper three fourths of the viscus.

The operation which I shall do is that of Wood. The assential point is to have no tension, and thus to avoid sloughs. Cleanliness is also especially important. I take the flap from above, about to where the umbilicus should be. The side flaps I make from the groins rather than from the sides of the abdomen, as Wood does, as by his method almost the whole belly is flayed. You will observe that the side flaps taken from the groin infringe upon the erectile tissue about the vulva, and thus give rise to considerable hæmorrhage.

[After this had ceased the flaps were brought into excellent apposition, and stitched with wire and catgut. The protusion of the bladder was entirely closed in except a small opening below. The skin of the belly was drawn together with two button sutures, and the raw surface over the abdomen two thirds closed. The wound was dressed with lint and carbolized oil, one to forty parts.]

HEART-PUNCTURE AND HEART-SUTURE AS THERAPEUTIC PROCEDURES. By JOHN B. ROBERTS, M.D.

(Read January 3, 1883.)

It is more than probable that, in a few years, puncture of the heart-wall (cardicentesis), with direct abstraction of blood by

aspiration, will be recognized as the best treatment in cases of
greatly dilated or much distended right heart, with intense pul-
monary engorgement; and that incision of the pericardium with
suture of the heart muscle will be accepted as proper in cardiac
wounds.   Hence these latest novelties in cardiac surgery deserve
the attention of the Fellows of the College.

That punctures of the heart are comparatively harmless has
been well known to many for some years.   In 1872, Roger,
while performing pericardicentesis on a child with pericardial
effusion, thrust the needle into the right ventricle and withdrew
about 6¼ Troy ounces (200 grams) of pure venous blood.   The
boy, who was aged five years, became pale, sweated, and had an
imperceptible pulse.   The withdrawal of the pericardial fluid,
accomplished prior to the heart injury, was beneficial; and the
cardiac puncture did no permanent mischief, for the patient
recovered.   Death occurred five months later from long existing
dilatation and valvular disease of the heart (*Bull. de l'Académie
de Médecine*, 1875, p. 1276).

In Hulke's case (*Trans. Clinical Society of London*, viii. p.
169), a woman with pleuro-pneumonia was supposed to have
large pericardial effusion, and a trocar was introduced through
the fourth left intercostal space.   Nothing escaped except a
drachm of venous blood, after which the patient seemed relieved
of dyspnœa.   She died four weeks later from a complication of
diseases, and the autopsy revealed cardiac dilatation and valvular
changes.

I have said elsewhere (*Paracentesis of the Pericardium*, 8vo.,
Philadelphia, 1880), in commenting upon this case: "The
abstraction of blood seemed to relieve the distended heart much
better than phlebotomy would have done, as was evinced by the
diminution of threatening symptoms and the decrease of the area
of dullness."

Cloquet, Bouchut, Legros, and Onimus have also observed the
apparent innocuousness of wounds of the heart made by capillary
trocars.   Steiner found, ten years or more ago, that electro-
puncture needles could be quite safely introduced into either ven-
tricle, provided they were at once withdrawn (*Med. Times and*

Gazette, May, 1873, p. 492, from *Langenbeck's Archiv. für klin. Chirurgie*).

It has been considered less safe to puncture the auricles; but the interesting paper of Dr. Benj. F. Westbrook, just published in the *Medical Record* for December 23, 1882, seems to show that our fears are as unfounded as were those of our predecessors in regard to ventricular puncture. It is, in truth, to call attention to his case of harmless *intentional* cardicentesis and to his researches in the surgical anatomy of the operation, that I have been led to refer to the corroborative evidence of the cases mentioned above.

I have with much satisfaction, as have many others, done venesection at the bend of the arm for the temporary relief of the distressing symptoms of dilated heart, and for the dyspnœa due to the pulmonary engorgement of acute pneumonia. If, however, a few *drachms* of blood drawn directly from the heart give the relief that could only be afforded by taking a similar number of *ounces* from the veins of the arm, it seems proper to adopt the former measure. The subsequent circulatory depression from anæmia would undoubtedly be less than after the latter operation.

It is manifestly necessary, however, to determine that cardicentesis is innocuous before it can take the place of venesection. The above-mentioned cases and Dr. Westbrook's experience tend to show that such is the fact.

Dr. Westbrook believes that the proper place to perform the operation is in the third costal interspace close to the *right* edge of the sternum. This situation enables the operator to tap the right auricle without injuring the right internal mammary vessels, and with little danger of striking the tricuspid valve. My own preference would be to perforate the ventricle of the right heart by introducing the needle through the fourth interspace, about one and a half or two inches to the *left* of the median line of the sternum. Dr. Westbrook's opinion, however, is entitled to more deference than mine, because he has studied the subject with special reference to cardicentesis, while my special investigations have been limited to the consideration of pericardicentesis.

Further experimentation in heart-puncture for the relief of cardiac distension and pulmonary engorgement is requisite, but it

is probable that it will soon become a well recognized surgical procedure in selected cases. Pericardicentesis has already taken that position, and there is no reason to believe that cardiac surgery will stop its march with the demonstration that the pericardium can be treated as the pleura.

In October, 1881, I read a paper before the Anatomical and Surgical Society of Brooklyn (The Surgery of the Pericardium ; *Annals of Anatomy and Surgery*, December, 1881), in which I advised resection of costal cartilage and incision of the pericardium for removal of foreign bodies in the pericardial sac; and at the same time said: "The time may possibly come, when wounds of the heart itself will be treated by pericardial incision, to allow extraction of clots, and perhaps to suture the cardiac muscle."

It seems as if this time had now almost arrived, for Dr. Block has not only expressed a belief that death can be averted in many cases of heart-wounds by simple incision of the pericardium to allow escape or extraction of the clots which cause pressure and death, but has also undertaken to demonstrate by vivisectal experiments that suture of the heart is a simple operation, and requires but three or four minutes (*Amer. Jour. of the Med. Sciences*, Jan. 1883, p. 276; from *Journal de Méd. de Paris*, Oct. 28, 1882; from *Gaz. Méd. de Strassburg*, Oct. 18, 1882). He finds that opening of the right and left ventricles, and entire compression of the heart for the application of sutures, can be supported by rabbits for several minutes. During suturing, he seizes the apex of the heart and draws the organ forward until the traction prevents the escape of blood from the wound. Sutures are then introduced, or the orifice closed by ligation. Even if cardiac pulsation and the respiration stop during this mechanical interference with the heart's movements, death, he asserts, does not necessarily ensue.

These experiments are even more important than the researches spoken of in regard to heart-puncture. I regret that as yet I have not been able to consult Dr. Block's original memoir, but I hope at a future time to do so, and perhaps to be able to report some investigations of my own which I desire to make in the same direction.

HYSTERICAL MANIA: ATHEROMATOUS DISEASE OF LEFT IN-
TERNAL CAROTID: THROMBOSIS OF ARTERIES AT BASE OF
BRAIN, WITH CONSEQUENT SOFTENING OF CEREBRAL SUB-
STANCE. By W. B. KESTEVEN, M.D.

The following case presents points of interest, both psycho-
logically and pathologically:

On the 30th of September last, I was requested to undertake
the care of a lady who was said to he suffering from a severe
form of hysteria. The patient came to me in the afternoon of
that day, was perfectly collected and cheerful, entered into con-
versation in the intelligent and self-possessed manner of an edu-
cated lady. She joined our family party at tea, and in the
course of the evening sat down beside a whist table, to watch the
game, as she herself said. In about half an hour she suddenly
left the room and retired to her bedroom, where, on being fol-
lowed, within a very short time, she was found almost in a state
of nudity, complaining that her bowels would not act, and
endeavoring to evacuate the rectum with her fingers. She talked
incoherently, was incessantly moving about; so restless that it
was impossible to keep her in bed by any persuasion, although
at the same time declaring herself paralyzed; she passed her
evacuations under her. On the following morning she became
quieter, kept to her bed the greater part of the day, but was still
incoherent. She took no food except by strong persuasion. On
the morning of the third day, while standing up to be dressed
she suddenly fell to the ground, but got up again, all the while
protesting that she had lost the use of her legs. She seated her-
self on the floor in the corner of the room, so as to support her-
self on either hand by the angles of the wall. She was cheerful,
even loquacious, for a few hours.

It became necessary to remove her to an asylum, which was
effected by carrying her, as it appeared that she would not, or
could not, stand. The sequel shows that she could not. As the
case, however, had previously been regarded as one of hysteria,
her want of muscular power was doubted. Dr. Wright, of
Northumberland House, Finsbury Park, under whose care she

was placed on Oct. 2nd, has obliged me by notes of her condition whilst under his observation. On admission, she was semi-comatose, and in a state of profuse perspiration. She did not move or speak. She would half-open her eyelids and gaze furtively around; her eyes were turned to the left. She seemed to be, to a great extent, aware of what was going on. She gave the impression that she was simulating paralysis and stertorous breathing. Her right side was "limp," but no marked difference from the state of the left side. No reflex action elicited on soles of the feet. Before she died there was a distinctly paralytic state of the left cheek and ptosis of the left eye. Her temperature rose to 103°, and her pulse to 130 during the day of her death, Oct. 4th. Dr. Wright has kindly furnished me with a copy of Dr. Goodhart's report of the macroscopic examination of the brain.

INSPECTION MADE 4 P. M., OCTOBER 5, 1882.

Cranial Bones.—Thin.

Dura Mater and Sinuses.—Healthy, except that dura mater was unduly adherent to skull.

Arachnoid and Pia Mater.—All looked quite healthy, but when stripped from the gray matter beneath on the left side the surface beneath was left ragged and soft; the color being unduly yellow, from the intermixture of blood pigment.

The *vessels* were all healthy except one, and that the left internal carotid. This vessel was obviously plugged by firm substance, and on making a transverse section of this part and examining it closely, it became evident that the coats of the vessel were extensively diseased here: that atheromatous thickening had occurred, leading to considerable diminution of the caliber of the vessel. This had, of course, been going on for some time, probably for many months. More recently, perhaps in the last two or three weeks, perhaps even more lately than this, the diminished channel had become completely closed by fresh clots being deposited upon the roughened arterial wall.

The transverse section of the artery thus showed an outer thick yellow zone, or partial zone, and an inner claret-colored part.

Looked at from above, the left hemisphere was makedly fuller than the right, and bulged out, more particularly in the lower part of the anterior, central, or ascending frontal convolution. It was in this part that the membranes, when stripped, left a ragged surface behind. Making sections of this hemisphere, it was found that the central cortex about this convolution—that is to say, it and the convolutions adjacent—was extensively swollen, so as to have lost its outline of demarcation from the white matter beneath ; it was echymosed in many places, minutely vascular in many more, and everywhere had lost its consistence when compared with the opposite hemisphere and the sounder parts of this one.

The lenticular nucleus, the corpus striatum, had suffered in the same way—bloated-looking and pulpy.

It was particularly noticed, and this has an important bearing on the symptoms, that except in the superficial layers of the gray matter, which were beginning to disintegrate, there was as yet no evident solution of continuity of the brain-fibers, and thus there had been no marked paralysis.

The ventricles and other parts of brain all looked healthy.

To the preceding I would add the results of my microscopical examination of portions of the convolutions taken from near the seat of the softened substance. These may be summed up as disintegration of structure by softening—atrophy of nerve-cells, dilatation of the minute vessels, and extensive miliary degeneration—conditions, all of which are indicative of longer-standing disease than would appear from the history of the case. The patient had always been regarded as hysterical. In the month of June last she had a transient attack of hemiplegia. After this she experienced paroxysms of hysteria, bordering upon mania ; she complained of tingling sensations in various parts of her body.

This case is worthy of note on account of the difficulty of diagnosis in its early stages, and the contrast presented between its later symptoms, compared with the extent of pathological lesions revealed after death.—*Brain.*

THE FRONTIERS OF MADNESS.

" The Frontiers of Madness" is the title of an interesting
lecture recently delivered by Dr. Ball, in his course at the Paris
Faculty of Medicine.   The generally received opinion that folly
and reason are separated by a strictly-drawn mathematical line,
is, according to Dr. Ball, quite erroneous.   There is a broad
frontier, he says, between sanity and insanity, which is peopled
by millions of inhabitants.   Damasippus, in Horace, laid down
the doctrine that all men are mad—" *insanus et tu, stultique
prope omnes.*"   Dr. Ball, without going quite so far as this, holds
that the number of persons perfectly reasonable on all points
throughout the entire period of their existence, form but a minor-
ity of mankind.   The world abounds with people, he tells us,
whom a strict scientific diagnosis would condemn as mad, or more
or less " touched ; " yet at no time of their life would it be per-
missible to put them under restraint.   Such persons are to be
seen occupying honorably and successfully every position in life
and society.   We brush against them when we take our daily
walks abroad ; we see them in the mirror which reflects ourselves.

Dr. Ball, having stated the thesis of his discourse, proceeds to
a classification of these " sane madmen," and designs the first
place " in the order of merit" (from what point of view he does
not specify) to those who suffer from unreasonable, aud, in most
cases, irresistible impulses.   Naturally enough, the lecturer re-
ferred to the case of Dr. Johnson, and the curious impulse which
prompted him to touch each post as he walked along the streets
—an impulse so strong that if he accidentally passed one by
without the usual tribute of a touch, he felt irresistibly compelled
to return and repair the omission.   The overpowering impulse to
laugh on occasions of peculiar solemnity is one which even the
most serious persons have experienced.   A still more morbid
impulse is that which sometimes urges pious people to indulge in
blasphemous or profane language.   A great English divine,
Bishop Butler, was tormented all his life long by this temptation,
which he only mastered by strong and sustained efforts of the
will.   The impulse sometimes assumes a suicidal form.

Dr. Ball was recently visited by a young man who was engaged to be married, but who found it impossible to visit his intended bride, because it would involve a journey of some length in a railway carriage, and he could never enter one without feeling a desire to jump out as soon as the train was in motion. He was advised to accustom himself gradually to this mode of traveling by taking short journeys on the suburban line, but he could never get beyond Auteuil; there he had to leave the carriage for fear of accident. Thouviot's case is one of the oftenest quoted. For years this unpleasant person was tortured with a burning desire to kill some woman or other; but he never felt the slightest wish to take the life of a man. He battled with the impulse for years, but at last it got the better of him. One day he murdered a young girl, a perfect stranger to him, whom unfortunate chance threw in his way in the kitchen of a restaurant. Dr. Ball was consulted some time ago by a painter of considerable talent, who was a prey to these murderous impulses. He had married early in life; his family was large, and his cares and anxieties large in proportion. At about thirty-eight, without physical ailment of any kind, or any specially unfavorable turn in his affairs, his mind began to be affected. If he saw a mirror, he experienced a desire to smash it; near a window, he felt a temptation to jump out; he never got a bank-note into his hand that he did not feel impelled to tear it in pieces. These morbid promptings presently assumed a more formidable shape; he began to be assailed with a temptation to strangle his children. His little daughter was dying of croup, and he spent night after night by her bedside, nursing her with the utmost tenderness. "Yet, said he to the physician, " at the moment when I was praying, with tears in my eyes, that the child's life might be spared, I was tormented with a horrible desire to take her out of the cradle and throw her into the fire. Even now," he added, "as I speak to you, I feel a most intense desire to strangle you; but I check myself."

It is a relief to turn from this tragic side of the subject to the comic aspects which it presents in the impulses of kleptomaniacs. The disposition to purloin objects of little or no value often manifests itself in persons of wealth and position quite removed from the reach of vulgar temptations. Some kleptomaniacs will

only take objects of a particular sort. Peddie mentions the case
of a very pious person who stole all the bibles he could lay his
hands on. Another kleptomaniac only stole clothes-pegs, and,
as he had absolutely no use for them, he amassed at last quite a
collection. Another worthy man's respect for the distinction
of *meum* and *tuum* broke down at once before a blue cotton
nightcap, although he never wore any but white nightcaps him-
self.

The tyranny of a fixed idea is another form which the mad-
ness of some people assumes. One sufferer feels an unctuous
sensation all over his body, and takes it into his head that he has
been dipped in grease. Another, a studious, intelligent young
man, is obliged to give up reading altogether, because each time
he turns over a page he imagines he has skipped a leaf. Back
he is obliged to go again, again the fancy returns, and so he
never makes progress. Dr. Cabade had once a patient whom he
described as an excellent man of business, who nevertheless felt
himself unable, though free from the slightest physical weakness,
to perform some of the simplest acts of daily life. He could not
cross the threshold of his door without being pushed from be-
hind. He could not rise from his chair without calling for help.
In the street his progress was liable to be stopped at any moment
by some imaginary obstacle, which no effort of the will would
enable him to cross. Akin to these cases, and not readily dis-
tinguishable from some of them, is that of the class of persons
whom we term hypochondriacs. Every one numbers among his
acquaintances some one who never tires of talking of the imaginary
ailments from which he is suffering. Many a medical student
has been driven half crazy from fancying that he had himself the
symptoms of the different diseases which his books describes.
Perfectly sane people, again, suffer from hallucinations of one sort
or other. Lelorgne de Savigny, for instance, to quote a well-
known case, was afflicted with visual hallucination, of which he
has left us an account; and which were of so painful a character
that he at last shut himself in a perfectly dark room, and passed
the remainder of his days there, having failed of obtaining relief
in any other way. And there is the case of a drunkard who
labored under a curious hallucination of the faculty of hearing.

He rose every morning full of the best resolutions, and deter-
mined to keep sober for the day. Unfortunately, the road to
where he worked, passed by a certain public house, and at some
distance from this fatal spot he became conscious of two voices
crying in his ear, the one " He will not go in," the other, " He
will go in." As he got near the door the voice of the
tempter increased in force till it quite drowned that of the good
angel. The matter always ended by his going in and taking a
drink, when the hallucination ceased as if by enchantment.—*St.
James's Gazette.*

SOME DELUSIONS REGARDING THE OYSTER. BY CHARLES L.
DANA, M.D., of New York City.

The oyster does not present a very lofty theme, and I venture
to apologize first for calling attention to it at the present length.

Mr. Herbert Spencer, in his address upon America, made no
reference to this interesting animal, and we are left to infer that
it has no importance in American society, and no definite relation
to the problems of evolution. But one may fairly claim that this
is a neglect, and that he went too far in ignoring what is so un-
obtrusive. For the oyster represents, very typically, that absence
from work and worry which should characterize the evolved life
toward which Americans are advised to strive. Furthermore, the
oyster, besides thus offering us certain valuable ideals, is a very
considerable factor in the social life of the " R " months.

With this preamble, I venture to submit some corrections of
prevalent errors regarding the mollusk in question.

1. That the oyster digests itself. For several years the
statement, quite uncontradicted, has been going the rounds of the
press, that the oyster digests itself. I believe that Dr. Wm.
Roberts first gave currency to it. The theory is that the oyster
has a large liver, which contains a diastase, and that this dias-
tase, in some inscrutable way, digests the whole animal, under
suitable conditions. Thus it has become a wide-spread belief
that the oyster, taken into the stomach, does, by virtue of its
liver, execute a kind of *felo de se.* Such a belief is very consol-
ing when a person is committing midnight indiscretions with

ostrea edalis, and it is unpleasant to be obliged to dispel it. Yet it is a fact, which the accompanying record of experiments will show, that an oyster has no more self-digestive power than a man.

The hepatic disatase referred to has no power except to change glycogen into sugar—a very trivial matter. It cannot even digest the liver tissue. I have kept oysters, previously crushed between the teeth, in water (temperature 100° F.) acidulated, and neutral for hours, with no resulting digestion whatever.) See experiments iii., iv., v.) I have even dissected out the liver, and given it the best possible chance to eat itself; but neither the mystic diastase nor any other ferment at all affected its succulent autonomy. The oyster does not and cannot digest itself.

2. That raw oysters are always more digestible than the cooked. I quite admit that the ordinary stew is less digestible than the plate of raw oysters. The stew generally contains milk, butter, and a larger number of oysters, all of which complicates the question. Half a dozen oysters, however, roasted* in the shell, or simply boiled a short time, will be digested nearly if not quite as rapidly as the same number of raw (See exper. i., ii). Cooking coagulates the albumen, but coagulated albumen may be more digestible than raw. Thus the white of an egg. unless thoroughly beaten, is lowly digested, and similarly, raw beef has to be finely minced in order to be quickly affected by the gastric juice. Cooking, on the other hand, loosens the tissue binding together the muscular fibrils, and allows the peptic juices to penetrate.

3. That fermented liquors dissolve or digest the oyster. Currency has been given in the *Reporter* and many other journals to the following highly instructive tale: Rev. Dr. Houghton, of Dublin, clergyman, physician and physiologist, was sitting with a friend at a restaurant. Raw oysters had been brought them. Believing, however, that it is proper *desipere in loco*, Dr. Houghton's friend ordered brandy ; he himself ordered ale. Wishing to demonstrate the wisdom of his choice and the beauty of physiological processes, Dr. Houghton poured some brandy into one glass, and ale into another, and then dropped an oyster into each. The oyster in the brandy grew hard and shrivelled ; that in the

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* Beaumont found the difference in his single case to be only 20 minutes.

ale gradually melted away in a diffusible invisible solution. *Moral:* Drink ale with oysters.

Now, Dr. Houghton's name and authority have great weight. I doubt if the incident related really occurred, yet it is widely circulated and credited. But it is quite as well, if one is bound to have bad and bibulous habits, to put them upon as near as possible a physiological basis. Therefore I venture to deny the possibility and accuracy of Dr. Houghton's alleged experiment, at least as regards American oysters. These grow hard in ale or beer, instead of dissolving. (Experiment vi.)

When any one becomes so dissolute, therefore, as to drink fermented liquors with his oysters, he should not allow his habits to be confirmed by a false confidence in the potency of malt diastase.

The following is a brief record of experiments made:

OYSTER.	TEST SOLUTION	TEMP.	DURATION OF EXPERIMENT.	RESULT.
I. Raw, masticated.	Aquæ, ℥ iij. HCl. 1 per cent. Pepsin (pure) gr. v.	100° F. to 110° F.	3½ hours.	Almost dissolved. Fine fragments and a piece of adduct or muscle left.
II. Boiled for 30 seconds.	Same solution as above.	As above.	As above.	About same result. Possible a few more fine fragmet's.
III. Raw, masticated.	Aquæ, ℥ iij.	As above.	As above.	Little if any apparent change. Liver not affected.
IV. Raw, masticated.	Aquæ, ℥iij. Sodæ bicarb, gr. x.	As above.	As above.	Same result apparently as in III.
V. Raw, masticated.	Aquæ, ℥ iij. HCl., 1 per cent.	As above.	As above.	Oyster tissue much softened ; liver nearly gone.
VI. Raw, cut into once to expose liver.	Beer, ℥ viij.	As above.	4 hours.	Oyster hardened ; liver not appreciably affected.
VII. Raw, cut into once as above.	Aquæ, ℥ ijss. Brand, ℥ s·. or 6 per cent.	As above.	4 hours.	Oyster tissue a little softer.

—*Medical and Surgical Reporter.*

DR. HARLEY in his admirable work on the Diseases of the Liver, just published, gives the following treatment of biliousness :

First give a single smart mercurial purgative. To a strong adult a powder consisting of

℞   Calomelanos...................................... gr. iij.
      Pulv. rhei....................................... gr. iv.
      Magnesiæ.. gr. x ij.
Sig.—Take at bed time.

After the free action of this mercurial alkaline purgative in order to stimulate the secretory function of the liver and retain the bowels in as fluid a state by getting into it as much tauro-cholate and glycocholate of soda as possible, I prescribe half an ounce of the following mixture, to be taken in the intervals of the meals three times a day, in half a tumbler of water :

℞   Sacci taraxaci .... ʒxv.
      Sodii sulphates .... ʒvj.
      Sodii bi-carbonates .... ʒij.
      Inf. calumbae ad .... ʒvj.   M.

Telling the patient to shake the bottle well before measuring out his doses.

Under prophylactic treatment he says :

" The regulation of the patient's food, drink and exercise is therefore the first—I might almost say the chief—thing requir-ing to be considered ; for, with a well regulated diet and régime, attacks of biliousness might be reduced to things almost un-known."

It is not only the quality but the quantity of the food that has to be regulated. For an excess of the most wholesome of foods acts in persons predisposed to biliousness as an exciting cause. Therefore it is a good plan never to allow the patient at any time to eat more than the wants of his system demand. If he is cor-pulent even put him on short commons. Stop his beer and reduce his wine to a couple glasses of hock or claret a day. If he be thin, or only moderately stout, only stop all salted food, ham, bacon, hung beef, haddock, etc. Order him to take noth-ing but fresh food—not too fatty, and rather underdone ; to

avoid shell fish and pastry ; to make his chief meal in the middle of the day ; to take as much walking exercise as he possibly can without fatiguing himself, and to go to bed early."   *   *

" In some persons with a more than usual tendency to biliousness, traceable to biliary secretion, besides chronic hepatic capillary congestion there sometimes exists also defective nerve action.   The secretory nerve twigs appear as if they had literally as well as figuratively gone to sleep, and I believe it is by waking them up, as it were, with small doses of nux vomica, that homœopathic practitioners have obtained the credit of being able to cure bad bilious attacks.   Certainly, for some years past, I have taken a leaf out of their book, and treated many cases of torpid liver with strychnia with marked benefit.   The rationale of the action of the strychnia in these cases appears to me to be precisely the same that it is in mild cases of paralysis, where it evidently calls nerve action into play, as is visibly seen by the paralyzed muscles twitching under its influence.   When given in torpid liver from defective nerve influence, the stimulating effect of the strychnia upon the nerve is, I think, rendered equally patent to our minds, though not to our eyes, by the increase of the biliary secretion.

Moreover, as a sluggish state of the bowels is a usual concomitant of a sluggish biliary secretion, I usually combine the strychnia with belladonna, which has a specific action on the intestines, and produces easy motions without purging the patient.

In order to gain a still further advantage, I give, as a rule, the strychnia and belladonna in combination with taraxacum, generally in the form of a dinner pill, to be taken at the commencement of the meal ; and, as I should like others to try my plan, its formula is as follows :

R,   Strychniæ acetatis .... gr. j.
      Ext. belladonnæ.............................. gr. vj.
      Aloes socotrinæ.............................. gr. xiv.
      Ext. taraxaci .... ℥ij.—M.
      Divide in pil................................... xxxvj.

In another place he says that many of the liver cases, especially those met with among women, are due in a great measure

to the pernicious, and also, now-a-days, but too common practice
of flying to sleeping draughts and soothing mixtures on every
trifling occasion; for nothing in the world so effectively and
promptly impedes the performance of the hepatic function as nar-
cotics be they opiate or chlorals. A couple of grains of opium
will bring on an attack of biliousness more speedily in most
persons than anything else; while its prolonged use will lead to
active as well as passive congestions of the liver.

NECROPSY OF M. GAMBETTA.

According to information forwarded to us from Paris, the
necropsy performed on the body of the late M. Gambetta com-
pletely justified the diagnosis of his medical attendants, and the
expectant treatment which they pursued. The wounds in the
hand and forearm were perfectly cicatrised, and are considered
to have played no part in the cause of M. Gambetta's death.
The termination of the ileum was found so much contracted,
that the finger could hardly be passed into it. Bands of adhesion
bound down the vermiform appendix, and there were traces of
old inflammation in the cellular tissue around the cæcum. Along
the course of the ascending colon the cellular tissue was infil-
trated with pus, which nowhere formed a distinct abscess. In
the substance of the abdominal wall, immediately adjacent to the
ascending colon, but not communicating with the collection of
pus around that portion of intestine, where sloughs of connective
tissue, and also purulent infiltration around them, but no true
abscess. There was no visible disease of the mucous membrane
of the intestines. A "certain quantity of, but very little,"
purulent fluid was found lying free in the peritoneum, due, it
was considered, to local extension of inflammation from the
region of the cæcum and colon. This explains the symptoms
observed during the last few days; lowering of the previously
high temperature to 98.6°; pulse, 130, flatulence, hiccough,
and coldness of the limbs. Intelligence was retained up to the
last moment, and M. Gambetta never realized that his life was
in danger. Our informant remarks that the bulletins relating to

M. Gambetta's illness have been much criticised here as being too sanguine in their tenor, but M. Gambetta, up to the last day of his life, read, or had read to him, all the newspapers, and it was therefore necessary to give somewhat vague information to the public in regard to his real condition. For many years, M. Gambetta suffered from symptoms of chronic perityphilitis extending along the ascending colon (hence the confusing term, "pericolitis," which has appeared in the daily papers, and become all the more confusing, through being sometimes mis-spelt pericholitis, as though the bile-duct were involved). This caused him much pain in the right flank and iliac fossa. Under the influence of the constitutional disturbance produced by the pistol-wound in the hand, but in no way through direct traumatic or pyæmic inflammation, the old-standing inflammation around the cæcum and ascending colon became acute, and assumed the form of diffuse phlegmonous inflammation ; and the abdominal walls also became the seat of the same kind of inflammation. The extension of inflammatiion to the peritoneum around the affected intestine completed the final result. It is perfectly evident, from the facts revealed by the necropsy, that surgical interference would but have hastened the fatal termination. All the remaining viscera were examined, notwithstanding their advanced stage of decomposition, hardly checked by the injection of some preservative fluid on the previous day. The lungs and heart were perfectly healthy. The liver was fatty, but not very large; there were no metastatic abscesses in any part of the body; the brain and its meninges were normal; there was no atheroma of the arteries, and only a small calcareous patch in the arch of the aorta, above the semilunar valves. The authorities present were Professors Paul Bert, Brouardel, Charcot, Cornil, Trélat, Verneuil; Doctors Lannelongue, Siredey, Fieuzal, Lionville, Mathias-Duval, Laborde, Guerdat, Gille, and M. Paul Gibier, house-surgeon. After the necropsy, performed by MM. Brouardel and Cornil, the brain of M. Gambetta was removed, in order that it might be weighed and preserved, under the directions of Dr. Charcot. This brain will ultimately be deposited in Dr. Broca's Museum of Comparative Pathology. The operation of embalming the corpse proved to be very difficult, on account of the great

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corpulence of the subject, and the troublesome dissection necessary before the carotids could be exposed for the introduction of the nozzle of the injecting-syringe.—*British Medical Journal.*

The brain of Gambetta weighed 1,160 grammes. This is less than that of any person who has attained distinction since the practice of measuring the cranium and weighing its contents was inaugurated. His skull was scarcely larger than that of the people of the stone age, whose remains are found in caves in various parts of France.

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The Use of the Mullein Plant in the Treatment of Pulmonary Consumption.

F. J. B. Quinlan, M.D., M.R.I.A., F.K.Q.C.P., Physician at St. Vincent's Hospital, Dublin, observes that "from time immemorial the verbascum thapsus, or great mullein has been a trusted popular remedy, in Ireland, for the treatment of phthisis." After relating seven cases where it proved of benefit, he concludes, " I have set down the above cases simply in the order in which they occurred, and with no view of supporting any preconceived idea. These cases, although too few to justify any general conclusion, appear to establish some useful facts. The mullein plant boiled in milk is liked by the patients; in watery infusion it is disagreeable, and the succus is still more so. The hot milk decoction causes a comfortable (what the Gallic neighbors call *pectorale*) sensation, and when once patients take it they experience a physiological want, and when the supply was once or twice interrupted, complained much in consequence. That it eases phthisical cough, there can be no doubt; in fact, some of the patients scarcely took their cough mixtures at all—an unmixed boon to phthisical sufferers with delicate stomachs. Its power of checking phthisical looseness of the bowels was very marked, and experiment proved that this was not merely due to the well known astringent properties of boiled milk. It also gave great relief to the dyspnœa. For phthisical night-sweats it is utterly useless; but these can be completely checked by the hyperdermic use of, from one-

eightieth to one-fiftieth of a grain of the atropia sulphate; the
smaller dose, if it will answer, being preferable, as the larger
causes dryness of the pharynx, and interferes with ocular accomo-
dation.   In advanced cases, it does not prevent loss of weight, nor
am I aware of anything that will, except koumiss.   Dr. Carrick,
in his interesting work on the koumiss treatment of Southern
Russia (page 213) says : ' I have seen a consumptive invalid gain
largely in weight, while the disease was making rapid progress in
her lungs, and the evening temperature rarely fell below 101°
Fahr.   Until then, I considered that an increase of weight in
phthisis pulmonalis was a proof of the arrest of the malady.'   If
koumiss possessed this power, mullein clearly does not; but un-
fortunately, as real koumiss can be made from the milk of the
mare only, and as it does not bear traveling, the consumptive
invalid must go at least to Samara or Southern Russia.   In pre-
tubercular and early cases of pulmonary consumption, mullein
appears to have a distinct weight-increasing power; and I have
observed this in several private cases also.   Having no weighings
of these latter, however, makes this statement merely an expres-
sion of opinion.   In early cases, the mullein milk appears to act
very much in the same manner as cod-liver oil ; and when we con-
sider that it is at once cheap and palatable, it is certainly worth a
trial.   I will continue the research by careful weighings of early
cases ; and will further endeavor to ascertain whether the addition
of mullein to the cultivating solution prevents the propagation of
the phthisical bacillus."—*British Medical Journal.*

IODOFORM IN DIPHTHERIA.

Diphtheria is a constitutional disease—this is not denied any
more ; but whether it is constitutional from the very beginning
is not only very doubtful, but contrary to all sound reasoning.
In case micrococci form really the pathogenic cause, they are first
seen on the place of primary local affection, and from here they
migrate and affect the blood in a similar, only more rapid, manner
as the syphilitic virus.   But granted that the disease is first purely

local, and effective local treatment should be followed by such re-
sults as prove that the constitutional affection has been prevented
by early destruction of the primary, local, existing evil.   Dr. J.
Benzon, in Buccari (*Wiener Med. Wochschrift*, 35–82), and Dr.
S. Korach in Cologne (*Deutch Med. Wochschrift*, 36–82) both
have made experiments with the local treatment of diphtheria by
iodoform.   The former treated one man, two women, two girls,
respectively aged 18 and 22, and a four-year-old child; and not-
withstanding the cases were all of grave type, under the local
treatment mentioned, they all ran a very favorable and rapid
course.   B. treated his cases as follows : He took a painter's brush,
1 ctm. wide, and dipped it into a finely-powdered iodoform till the
points were all colored yellow.   He then depressed the back of
the tongue and applied the iodoform with the brush to the diph-
theretic membranes.   This procedure was repeated by B. in the
beginning of the disease every two hours, about eight times dur-
ing the day and six times during the night.   With the exception
of ice application to the neck, this formed the whole treatment.

He made use of this treatment under and by direction of Prof.
Leichtenstern, the physician-in-chief of the Cologne City Hospi-
tal.   For nearly a year all the patients in this institution suffering
from diphtheria were treated with iodoform alone ; cleansing injec-
tions with unmedicated water being the only local or internal
medication used besides.   First, iodoform triturated with amylum,
was insufflated ; then the dry powder alone was put by a brush
upon the membranes.   Later these methods were dropped, and
instead of them iodoform with collodium (1 : 10) brushed six times
daily over the diphtheritic exudations, the latter having each time
been previously totally dried with a linen rag.   Sometimes a so-
lution of 2.5 in 25.0 sulph-ether, and 5.0 tolu balsam, was made
use of.   The splendid results gained—of 213 cases only one death
by laryngeal diphtheria—should induce far more extensive trials
with this drug.—*Medical and Surgical Reporter.*

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THE ABSORPTION OF NUTRIENT ENEMATA.—Dr. Charles L.
Dana, of New York, communicates to the *Medical Record* the

results of a series of experiments upon dogs, made to determine the physiological process by which nutrient enemata are absorbed. He finds that large injections forcibly administered *may* cause a "retrostasis," which will carry the material by the ileo-cæcal valve, and even into the stomach; moreover, that, in dogs, ordinary nutrient injections of two, three, or four ounces pass back some distance, and may even reach the ileo-cæcal valve, but do not go farther, the injection being carried back much better when the lower bowel is empty or comparatively so. He believes that the clinical cases are exceptional in which retroperistalsis occurs, and concludes that the process is usually effected by local absorption. The fact that the colon is very vascular and has a large supply of lymphatics confirms the view that it is not an excreting organ, but its function in man is that of absorbing : in solipeds it has a powerful digestive action. He observes that albuminous food, when injected, speedily undergoes chemical changes and decomposition. In some of the early stages of this process it is quite possible that the changed albumen passes into the surrounding vessels. Normal peptic digestion is only a decomposition with many stages in it, during some of which the albuminous matter is absorbed. It is not necessary that albumens be made perfect peptones before they can diffuse into the blood vessels and lymphatics. Fats cannot be absorbed to any great extent in the colon or rectum. It is not necessary to inquire whether starches can be changed to glucose, since it is always possible to add some form of animal sugar to the enema if that be thought necessary. Milk and beef tea are regarded as very nearly as effective as the expensive peptonized preparations for use in nutrient enemata, the value of which may be regarded as established both by physiological experiment and abundant clinical experience.—*Medical Times.*

TREATMENT OF DYSENTERY.

Mr. F. Rawle, M.R.C.S., observes that, at the present time, when dysentery is very prevalent, especially amongst those who have returned from the Egyptian war, any suggestion that may

mitigate the suffering of so fatal a malady will be hailed with gratitude. The plan he has used with most success is the following: First, having placed the patient between warm blankets, a pint and a half of warm water, at a temperature of 90° Fahr. is injected. This is seldom retained longer than a few minutes, but is pronounced very grateful to the patient. When the water has soothed the mucous membrane of the colon and rectum, and brought away any *effete* matter, two ounces, by measure, of the following enema is administered with a gum-elastic bottle. ℞. Quinine sulphate, ten grains; compound tincture of camphor, four drachms; decoctum amyli to two ounces. Mix, and when about milk-warm, inject, which is generally retained; but, if ejected, it may be repeated after an hour or two. This has been found of great service, and very grateful to the patient; the effect is like magic. If griping pains be felt over the region of the epigastrium, half-drachm doses of chlorodyne, in some aromatic water, mint, carraway, or aniseed should be given. The diet, of course, should be of the most soothing kind; jellies, isinglass, linseed, toast and barley water *ad libitum*. Ipecacuhana appears of little service, and Mr. Rawle has discarded it from his treatment. Warm turpentine stupes on warm flannels, over the hypogastrium prove very beneficial.—*British Medical Journal.*

DR. DOVER.—People whose "inward griefs and peristaltic woes" have been relieved by the power of Dover, do not generally know to whom they are indebted for this excellent compound. The doctor was a friend, and probably a pupil, of the great Sydenham. He commenced practice in Bristol, where, having made some money, he longed to make more. The roll of the College of Physicians tells us that he joined with some merchants in fitting out two privateers for the South Seas, in one of which, the "Duke," he himself sailed from Bristol, August 2, 1708. On the passage out they touched at the island of Juan Fernandez, where Dover, on the 2d of February, 1709, found Alexander Selkirk, who had been alone on the island four years and four months, and whom Dover brought away in the "Duke." In the

April following, Dover took Guinaguil, a city or town of Peru, by storm. In December, 1709, the two privateers took a large and valuable prize, a ship of twenty guns and 190 men, in which Dover removed from the "Duke," taking Alexander Selkirk with him as master, and finally reached England in October, 1711. After this cruise Doctor Dover removed to London, where his practice soon became great. His patients, and the apothecaries who wished to consult him, addressed their letters to the Jerusalem Coffee House, where, at certain hours of the day, he received hosts of his patients.—*Canadian Journal of Medical Science.*

THE CRIMINAL SPREAD OF INFECTION.—Judge Dixon, of New Jersey, in a recent charge to the grand jury of Paterson, called their attention to the case of a man employed at the pest house as nurse to a small-pox patient, and who, having the germs of the infectious disease about him, went recklessly to his family, communicating the disease to his children, one of whom died. In commenting on this case, he said : " If a man, conscious that he carries about with him the germs or a contagious disease, recklessly exposes the health and lives of others, he is a public nuisance and a criminal, and may be held answerable for the results of his conduct. If death occurs through his recklessness he may be indicted for manslaughter. It is held that where a person knowingly communicates a contagious disease to another, and death results, the crime is that of manslaughter." Judge Dixon furthermore added : " The man may be indicted also for spreading the disease by conscious exposure of others thereto by his presence in public places, such as on the street, in halls, etc. He might be indicted as a public nuisance for endangering the public health in this way, even if no consequences had followed. The law provides some penalty for such offenses against the public safety."—*Boston Med. and Surg. Jour.*

Items.

A meeting of the stockholders of the Chicago Dental Infirmary was held in the club rooms of the Sherman House, February 5th, for the election of officers. Drs. N. S. Davis, Wm. Byford, A. Reeves Jackson, Norman Bridge, N. B. Delamater, Gorton Nichols, Marvin Smith, Eugene S. Talbot, Frank Gardiner, Truman W. Brophy, Edgar D. Swain, James A. Swasey and A. W. Harlan were elected a board of directors. Dr. J. A. Swasey was chosen president, Dr. M. E. Smith vice-president, Dr. E. S. Talbot recording secretary, Dr. T. W. Brophy corresponding secretary, Dr. E. D. Swain treasurer. An executive committee, consisting of Drs. F. Gardiner, T. W. Brophy, E. S. Talbot, A. W. Harlan, and Gorton Nichols, was appointed, to place the infirmary upon a working basis. Rooms have been secured, and the chairs filled. It is expected to have the institution in operation by March 1st. The objects of the infirmary are : to provide the best treatment for worthy poor at a cost only of the material used, and to educate medical students, who so desire, in the art and science of dentistry. It is conceded generally that the time has come when dentistry must rank equally with other specialties in medicine. The American Medical Association has already recognized the specialty. The dental colleges are gradually requiring a more thorough education, and now nearly every chair in the medical college is included in the course, plus operative and mechanical dentistry, thus requiring more of the dental student than the medical student when only the degree of D. D. S. is conferred. Students entering the infirmary must have matriculated in some medical colleges of good standing. After attending two courses of clinical instruction and found qualified, they will receive

diplomas, pro viding the degree of M. D. has been conferred.   An-
other new departure in medical teaching was inaugurated in the
medical colleges last fall.   Full chairs on dental pathology and sur-
gery were added to six of the seven colleges, and instruction on den-
tal and oral diseases was given in the regular winter course.
These chairs were filled by graduates of medicine who are prac-
ticing dentistry in Chicago.   Whether the interest manifested by
students was owing to the novelty of the subject or a desire to
acquire a knowledge of the diseases emanating from the teeth,
it certainly was very encouraging to those having charge of this
branch of medicine

AN Army Medical Board has been ordered to assemble at the
Army Building, corner of Houston and Greene streets, New
York City, New York, March 1, 1883, for the examination of
such persons as may be properly invited to present themselves
before it as candidates for appointment in the Medical Corps of
the army, and will probably continue in session about three
months.

All candidates for appointment in the Medical Corps must
apply to the Secretary of War for an invitation to appear for
examination.   The application must be in the handwriting of the
applicant, must state date and place of his birth and place and
State of which he is a permanent resident, and must be accom-
panied by certificates based on personal acquaintance from at
least two persons of repute as to citizenship, character and moral
habits : testimonials as to professional standing from Professors
of the Medical College at which they graduated, should also
accompany the application if they can be obtained.   The candi-
date must be between twenty-one and twenty-eight years of age
(without any exceptions), and a graduate of a regular medical
college, evidence of which, his diploma, must be submitted to
the Board.

Further information regarding these examinations and the
nature thereof, can be obtained by addressing the Surgeon Gen-
eral, U. S. Army, Washington, D. C.

DEATH OF DR. MUDD, sentenced to life imprisonment for harboring J. Wilkes Booth.—Dr. Samuel A. Mudd, who served a term in the Dry Tortugas for harboring John Wilkes Booth, the assassin of President Lincoln, and assisting him to escape, died January 3d, at his residence, near Bryanstown, Charles county, South Carolina. Dr. Mudd came of an old family of prominence and influence in southern Maryland. After the assassination, Booth and Harold rode to Dr. Mudd's home, and he dressed Booth's injuries. He found that Booth's right leg was fractured, the bone being broken clear through just above the ankle. The leg was much swollen, and Dr. Mudd insisted on Booth remaining at his house all day and part of the next night. Dr. Mudd was sentenced by the court to be confined for life at hard labor, and President Johnson ordered him and others to be sent to the Albany Penitentiary. He was subsequently sent to the Dry Tortugas, where, during a yellow fever epidemic, he rendered such valuable services, that, after a few years' confinement, he was pardoned by President Johnson.—*Gaillard's Medical Journal.*

CASE OF TRAUMATIC RECTO-VESICAL-FISTULA.—Dr. W. M. Bemus, of Jamestown, N. Y., reports to us briefly an interesting case of injury to the rectum and bladder. The patient, aged about 25 years, fell from about twenty feet, striking upon a sharp stub, about two inches in diameter, which penetrated the rectum for about six inches, and entered the bladder above the prostate. Urine passed freely from the anus after the withdrawal of the stick. Treatment consisted of anodynes as needed, hot fomentations and the retention in the urethra of a flexible catheter. At the date of the report, six weeks after the injury, the patient was apparently as well as ever, with no evidence of a recto-vesical fistula, and no pain in urinating or at stool.—*Colorado Med. Journal.*

TO DISGUISE THE ODOR OF IODOFORM.—We have had many queries as to how this may be best accomplished; we therefore give every reliable report on the subject. The following is from

the *New York Medical Journal and Obstetrical Review*: "Having tried nearly all the devices that have been suggested for mitigating or disguising the odor of iodoform, and found them all of little or no avail, we have lately come nearer to the object by using oil of eucalyptus, according to the following formula :

> ℞ Pulv. iodoform....................................℥ ss
>   Oil eucalypt.......................................℥ ss
>   Vaselin...℥ iv.

M. ft. ungent.

This ointment is not without odor, but the odor is not that of iodoform."—*Med. and Surg. Rep.*, Jan. 13, 1883; *Am. Jour. Pharmacy.*

At the meeting of the Chicago Medical Society Dr. E. F. Ingals presented the following case, referred to him by Dr. Mackenzie :

Simon Ladinski, Feb. 15, 1877, was hung by a band of robbers; at the same time having his throat cut, severing the trachea. He also received two other knife wounds. After two hours he regained consciousness. Two days later was removed to a hospital; was five years and a half under the care of Prof. Schotter. After the main wound healed the glottis was found so small that only a filiform bougie cruld be passed. Dilatation was practiced steadily for about two years; the patient was then taught to use Schotter's dilator himself. He now wears the tracheal tube constantly, with plug of Schotter's dilator every night. This plug is about half an inch broad by three-eighths inch thick, and one and a half inch long. In a few months it is hoped the external wound may be closed.

THE *Illustrated Quarterly of Medicine and Surgery*, edited by Drs. George Henry Fox and F. R. Sturgis, and published by E. B. Treat, No. 757 Broadway, New York, is doubtless the most magnificent medical journal published. No. 4, of Vol. 1, which is just to hand, has nine original articles, illustrated by three chromo-lithographic plates and fifteen wood-cuts. The subscription price is $8 per year. We don't see how it can be done at

that price, but if the publishers can stand it, the reader certainly
has no reason to complain.—*Medical Chronicle.*

The Chicago Homœopathic Medical College will, after this
session, cease to matriculate females. This conclusion was
reached by a unanimous vote of the faculty. We congratulate
them on the advancement. The co-education of the sexes in the
practice of medicine and surgery must be very embarrassing and
must lead to poor teaching. Women desirous of studying medi-
cine can find every facility for the purpose in the Woman's
Medical College of Chicago. The Chicago Homœopathic Col-
lege has forty-five candidates for graduation.

THE Illinois State Board of Health, through its indefatigable
Secretary, Dr. John Rauch, has sent us three circulars entitled
" Preventable Disease Circulars," No. 2, Diphtheria ; No. 3,
Scarlet Fever ; No. 4, Typhoid Fever. The circulars, in an ad-
mirably succinct manner, detail the methods of prevention and
control in these affections. They are well worth the careful study
of physicians, and we congratulate the board upon their literary
and scientific merit and general distribution.

THE Health Department of Chicago, gives in its January state-
ment the following facts : Total population 1882, 560,693 ; total
deaths January, 966. The greatest number of deaths resulted
from phthisis pulmonalis, 99 ; convulsions infantile, 74 ; diphthe-
ria, 73 ; pneumonia, 74 ; scarlet fever, 39. There were ten deaths
from suicide ; thirteen deaths from small-pox. There were 212
deaths less than last January. The annual rate per 1,000 was
20.67.

ALFRED STILLE has been elected President of the Philadel-
phia College of Physicians, and Dr. Fordyce Barker has been re-
elected President of the New York Academy of Medicine. The
New York Poliklinik had sixty-four students at its first session ;
only legally qualified practitioners are admitted as students.—
Maryland Med. Jour.

THE HAMMOND PRIZE.—The American Neurological Association offers a prize of five hundred dollars, to be known as the " William A. Hammond Prize," and to be awarded at the meeting in June, 1884, to the author of the best essay on the " Functions of the Thalamus in Man."

The conditions under which this prize is to be awarded are as follows .

1. The price is open to competitors of all nationalities.

2. The essays are to be based upon original observations and experiments on man and the lower animals.

3. The competing essays must be written in the English, French, or German language : if in the last, the manuscript is to be in the Italian handwriting.

4. Essays are to be sent (postage prepaid) to the Secretary of the Prize Committee, Dr. E. C. Seguin, 41 West Twentieth street, New York City, on or before February 1, 1884; each essay to be marked by a distinctive device or motto, and accompanied by a sealed envelope bearing the same device or motto, and containing the author's visiting-card.

5. The successful essay will be the property of the association, which will assume the care of its publication.

6. Any intimation tending to reveal the authorship of any of the essays submitted, whether directly or indirectly conveyed to the committee or to any member thereof, shall exclude the essay from competition.

7. The award of the prize will be announced by the undersigned committee, and will be publicly declared by the President of the association at the meeting in June, 1884.

8. The amount of the prize will be given to the successful competitor in gold coin of the United States, or, if he prefer it, in the shape of a gold medal bearing a suitable device and inscription.

Signed, { F. T. MILES, M.D., Baltimore.
          J. S. JEWELL, M.D., Chicago.
          E. C. SEGUIN, M.D., New York

VACCINAL MICROCOCCI.—The Lancet says that M. Straus has plainly demonstrated the presence of the special micrococcus in

microscopical preparations of the vaccinal pustule from the calf. He places the excised fragments of the skin in absolute alcohol, cuts sections and stains them with methylamine violet, and then discolors them, until only the nuclei, the bacteria and micrococci remains visible. Under a strong magnifying power the latter were visible as extremely minute points tinted blue, about a thousandth part of a millimetre in diameter, and grouped in colonies.—*Ex.*

A RECEPTION TO THE PRESIDENT AND VICE-PRESIDENT OF THE AMERICAN MEDICAL ASSOCIATION.—Dr. John V. Shoemaker, the editor of the *Medical Bulletin*, lately gave a reception at his house in Philadelphia, in honor of Dr. John L. Atlee, of Lancaster, Pa., and Dr. Alexander G. Stone, of St. Paul, Minn., the former the President and the latter the Vice-President of the American Medical Association. A great number of well-known members of the profession were present, not only from Pennsylvania, but from several of the neighboring States, and the affair is said to have been very brilliant.

THE *Illustrated Medicine and Surgery*, published by E. B. Treat, New York, under the able editorial management of Dr. Geo. H. Fox and others, is one of the most valuable of our exchanges. Its illustrations are taken from cases occurring in the practice of the best known metropolitan physicians and surgeons, and are executed with an accuracy and skill which make them exceedingly useful to the physician of every grade of proficiency and experience.

We take especial pleasure in recommending the *Illustrated Medicine and Surgery* to our readers.

DR. SEGUIN'S HEALTH.—After the tragedy which left Dr. Edward C. Seguin a childless widower, he went abroad for a change of surroundings, and has been traveling since that time in various parts of Europe. "The latest letters from him," said his brother-in-law, Dr. Amidon, recently, "show that Dr. Seguin has entirely recovered his health. It is uncertain when he will return, if ever, or whether he will resume practice in this city."

CHLORINATED SODA.—A solution of this is made as follows : To a pint of distilled water add two ounces of fresh chloride of lime, shake thoroughly, then slowly add it to a saturated solution of common washing soda until it becomes thick and turbid ; let it stand until thoroughly settled, when the clear liquid should be taken off with a siphon, when it is ready for use. It should be kept tightly corked in a dark place.—*Ex.*

THE CHAIR OF ANATOMY AT HARVARD.—At a recent meeting of the Board of Overseers of Harvard University, Dr. Thos. Dwight, instructor in topographical anatomy, was appointed to fill, for the remainder of the year, the chair of anatomy, made vacant by the resignation of Professor Holmes.

TIT, BUT NOT TAT.—If any one is so wicked as to poison his grocer, who brings him food every day, the severest penalty of the law would be enforced, but if your grocer poisons you by adulterating your food, ten chances to one no notice will be taken of it.—*Ex.*

The many friends of Prof. S. J. Jewell will be pleased to learn that his health has received much benefit by his sojourn at the Hot Springs, and that he expects to resume his professional labor by the 1st of April next.

LEPROSY.—Charles Derby, a recent arrival from San Francisco, has developed into a leper at the almshouse in Salem, Mass. He was botanist to Queen Emma at Honolulu for some years.

Dr. S. B. Craver will succeed Dr. E. K. Oliver as resident physician, with Dr. Dobbins as assistant, at the Chicago Hospital for Women and Children, during the coming year.

DR. M. A. PALLEN having resigned the chair of gynæcology in the New York Post-Graduate School, Dr. B. F. Dawson has been appointed to the position.

CLINICS.

MONDAY.

Eye and Ear Infirmary—1.15 to 2.15 p. m.. Otological, by Dr. Schaefer; 2.15 to 3.30 p. m., Ophthalmological, Dr. Holmes.

Mercy Hospital—2 p. m., Medical, Profs. Hollister and Quine.

Rush Medical College—2 p. m., Medical by Prof. Bridge; 3 p. m., Dermatological and Venereal, by Prof. Hyde.

Woman's Medical College—2 p. m., Dermatological and Venereal, by Prof. Maynard.

TUESDAY.

Cook Co. Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Surgical Clinic, by Prof. Andrews.

Woman's Medical College—10 a. m., Prof. Ingals.

WEDNESDAY.

Chicago Medical College—2 p. m., Eye and Ear, by Prof. Jones.

Rush Medical College—3 p. m., Ophthalmological and Otological, by Prof. Holmes: 3 to 4 p. m., Diseases of the Chest, by Prof. Ross.

Woman's Medical College—2 p. m., Eye and Ear, by Dr. W. T. Montgomery; 3 p. m., Diseases of Children, by Prof. Chas. W. Earle.

Eye and Ear Infirmary—2.30 p. m.. Dr. E. J. Gardiner.

THURSDAY.

Chicago Medical College—2 p. m., Gynæcological, Prof. Dudley.

Rush Medical College—2 p. m.. Diseases of Children, by Prof. Knox; 3 p. m., Diseases of the Nervous System, by Prof. Lyman.

Eye and Ear Infirmary—1.15 to 2.25 p. m., Otological. by Dr. Schaefer; 2.15 to 3.30, p. m., Ophthalmological, Dr. Holmes.

Woman's Medical College—3 p. m., Surgical, by Prof. Owens.

College of Physicians and Surgeons—2 p. m., Medical. by Prof. S. A. McWilliams; 3 p. m., Surgical, by Prof. R. L. Rea.

FRIDAY.

Cook County Hospital—2 to 4 p. m., Medical and Surgical Clinics.

Mercy Hospital—2 p. m., Medical, by Prof. Davis.

SATURDAY.

Rush Medical College—2 p. m., Surgical, by Prof. Gunn.

Mercy Hospital—2 p. m., Surgical Clinic, by Prof. Andrews.

Chicago Medical College—3 p. m., Neurological, Prof. Jewell.

Woman's Medical College—2 p. m., Gynæcological, by Prof. T. D. Fitch.

College of Physicians and Surgeons—2 p. m., Diseases of the Chest, by Prof. S. A. McWilliams; 3 p. m., Gynæcological, by Prof. A. Reeves Jackson.

Daily Clinics, from 2 to 4 p. m., at the Central Free Dispensary, at the South Side Dispensary and at the West Side Dispensary.